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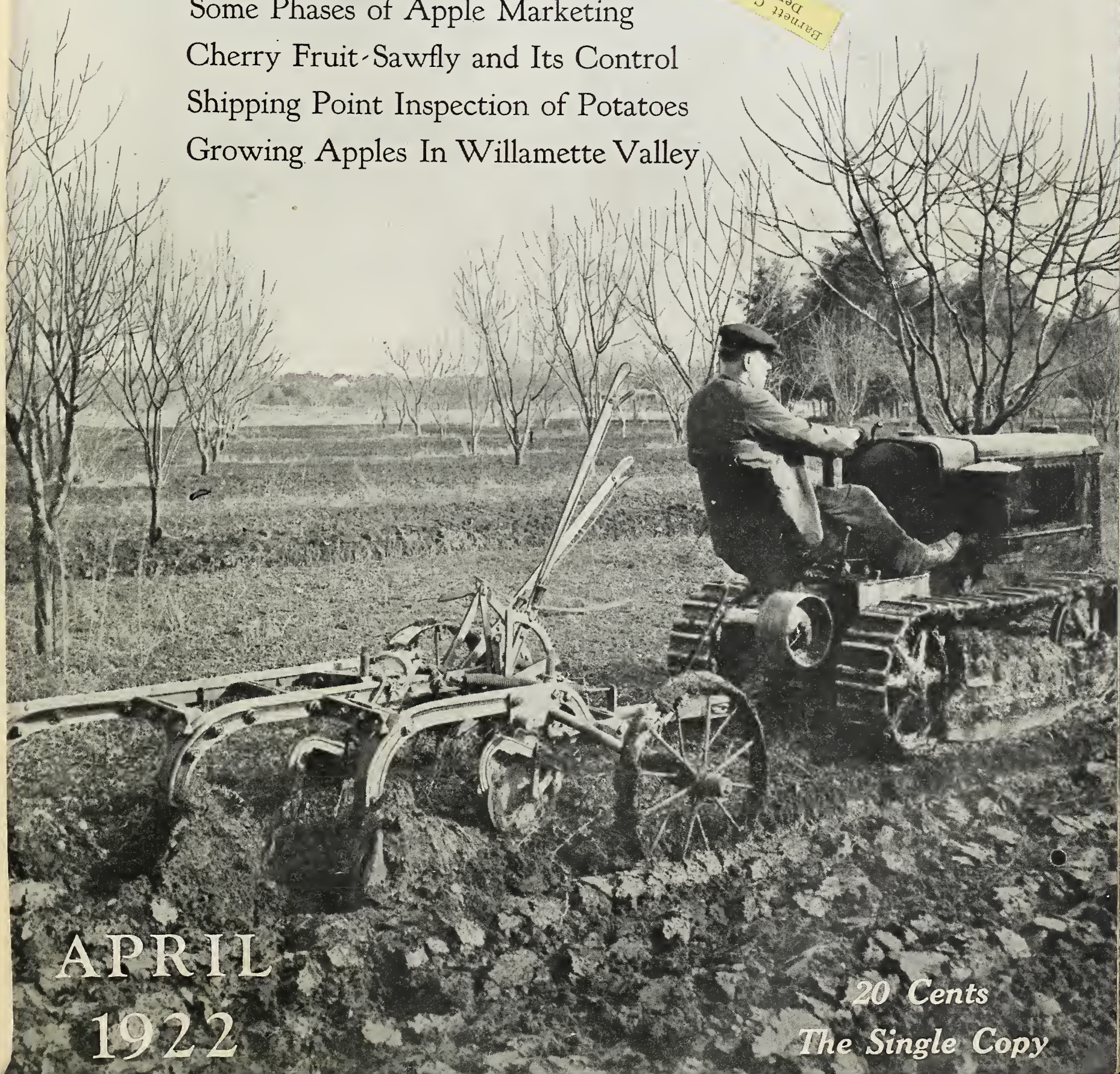
BETTER FRUIT

The Pioneer Horticultural Journal of the Pacific Northwest

Features In This Issue :

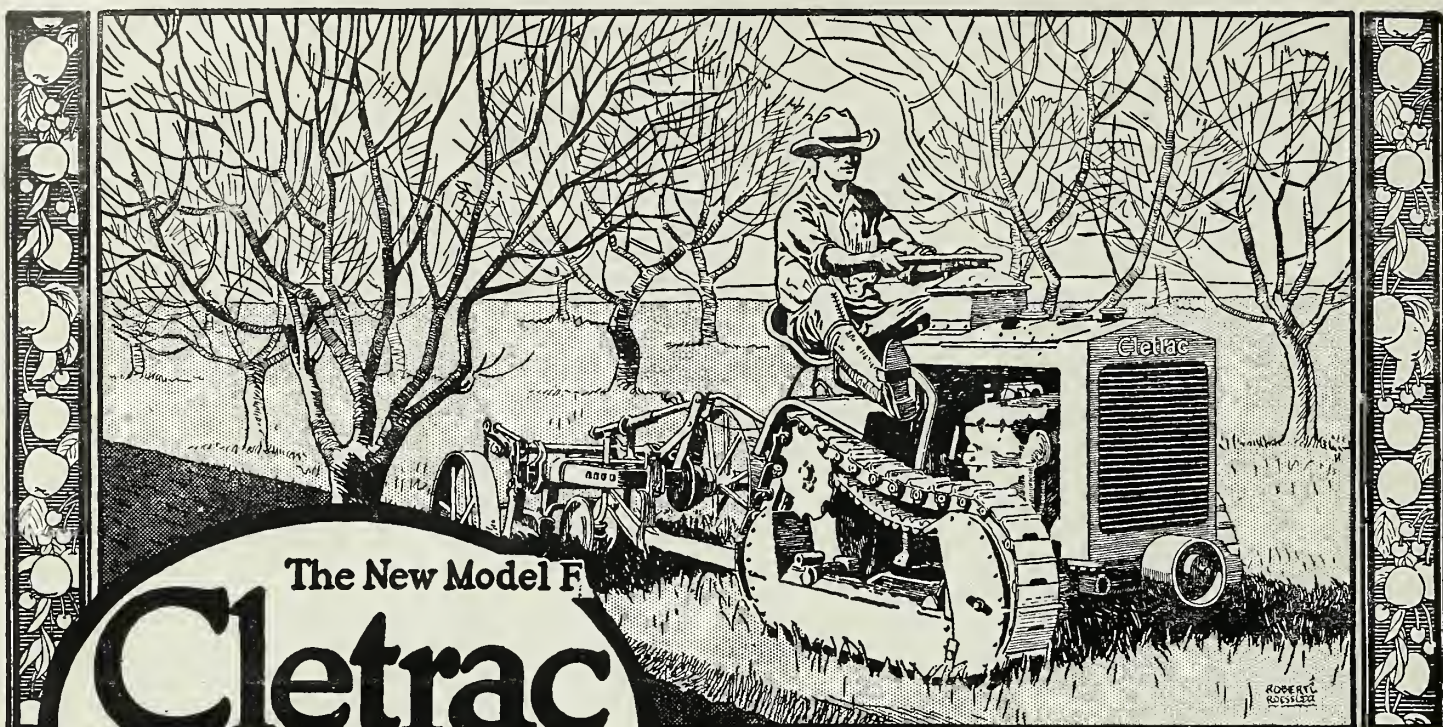
Pests of the Strawberry Industry
Crown Gall, Its Cause and Cure
Some Phases of Apple Marketing
Cherry Fruit-Sawfly and Its Control
Shipping Point Inspection of Potatoes
Growing Apples In Willamette Valley

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BETTER FRUIT

The Pioneer Horticultural Journal of the Pacific Northwest

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Pests of the Strawberry Industry

By C. O. WEISS

District Horticultural Inspector, Everett, Washington

STRAWBERRIES are subject to only a few diseases in northwestern districts, but of insect pests there are quite a few that are already well established and have proven serious. This does not mean that the strawberry industry is doomed, as there is usually relief in sight. In all cases it does not mean that absolute control methods are present, but when certain methods are used and followed the industry can go on.

First and foremost, be sure and have your plants inspected in the field before setting out a new patch. Second, be sure that the patch you are setting is free from the diseases and pests by knowing past history and conditions of crops grown there. Also, if your neighbor's patch or your own patch is infested, protect your new one from them.

LEAF SPOT—Our most common disease of the strawberry throughout this district is the leaf spot. The disease makes its appearance on the leaf calyx and fruit stems. The spots are very small, deep purple or red, and are usually first in evidence on the upper surface of the leaves. Eventually they become gray or white in the center. The cause is a fungus which lives within the leaves throughout the year, remaining within the leaf during the winter.

Control measures are these: Plant only healthy plants, procured, if possible, from fields where the disease is not present. In any case, all diseased leaves from plants should be picked off before planting. The common practice of mowing off and burning leaves after harvest is beneficial, as it destroys the leaves with the fungus in them. If the trouble is serious, use Bordeaux mixture 4-4-50. Spray first before blossoming; second, after blossoming, and third, after harvest.

RHIZOCTONIA—The Rhizoctonia is a soil fungus which works in the soil and works its chief injuries by causing rots of the stem under the ground or by rotting off roots. The roots are rotted off and the top of the plant shows the effects by the outer leaves dying first, leaving the center leaves green. These often die soon also. Often the leaves

There is excellent promise that this season will be a favorable one for strawberry growers of the Northwest. Reports indicate that the plants have come through the winter in the best of condition, in nearly every district, and greater cannery capacity than ever before will be a helpful marketing factor. For the good of the industry it behooves every grower to be on the alert for diseases and pests inimical to the strawberry. The excellent resume on pests and control measures here presented by Mr. Weiss is that he gave recently before the Western Washington Horticultural Association convention.

turn reddish and then brown when dying.

There is no remedy except the rotation of crops to reduce the amount of fungus in the soil. There is one significant fact in connection with Rhizoctonia on strawberries that should be noticed. When this fruit is put on ground following potatoes, the Rhizoctonia is almost always quite severe. So do not follow potatoes with strawberries directly, but let some other crop intervene. Potatoes are always very subject to, and often severely troubled with Rhizoctonia, and when they have been in the soil leave a residue of the disease behind them. For the control of the Rhizoctonia, start a rotation, using crops known to be not affected by the fungus such as grains, grasses and clover.

FRUIT ROTS—Fruit rots result from the berries coming in contact with the damp earth and becoming rotted on the lower side. Sometimes other areas in the fruit become rotted. One form of rot that does this is the gray mold or Botrytis mold. Often the affected areas will become covered with a mass of gray mold. This trouble may spread and involve the whole fruit cluster.

Control of this trouble consists in avoiding a wet location, obtaining good drainage,

keeping the weeds down and also mulching to keep the fruit from the ground.

STRAWBERRY ROOT WEEVIL—The strawberry root weevil is by far the most injurious insect pest of the strawberry, in Washington. Just recently the serious nature of the pest has been brought into prominence because of the quarantine issued by the department of agriculture of the state of Washington, which prohibits anyone from selling, bartering or giving away strawberry plants that have not passed inspection.

The strawberry root weevil was undoubtedly introduced from Europe. The first report we have of it in this country is in Massachusetts in 1852. Since that time it has spread steadily westward and also northward. It was reported from Wyoming in 1893, from New Mexico in 1894, from Minnesota in 1895, from Montana in 1897, and from Washington in 1904. When we consider the fact that this insect cannot fly, but must almost depend entirely on outside agencies for transportation, its spread seems fairly rapid.

In a survey I have made, this pest has been found in many communities of Snohomish, Skagit and Whatcom counties.

DESTRUCTIVENESS—Strawberry root weevil is a pest both as a beetle and a grub. The beetles feed on the foliage, stripping and ragging it in a characteristic manner. The grubs, however, are by far the more injurious. They feed on the entire root system of the strawberry. The smaller grubs are usually found feeding on the fibrous rootlets, often devouring them entirely or barking them so they die. A seriously infected plant may be kicked out with the foot or easily pulled up, often with the fibrous root system eaten away.

Undoubtedly a portion of the grubs feed close to the main tap root and their feeding there will sometimes girdle the crown. The larger grubs are often found buried in the tap roots and this food seems to give them a more pinkish cast, giving rise to the common belief that two species of larvae are present.

The beetles may be present in a patch

for years and but little injury result from their attack. In certain localities they have been observed for several years, yet even the older fields show no apparent injury.

A common practice is to plant in the early spring, cultivate well the first season and keep down all the runners. A half-crop is expected the next season and a full crop the second season, or the third spring from planting. Ordinarily the field is kept as long as possible to derive profit from it and often, in the infested districts, it is kept too long.

In the weevil districts, under normal conditions, an infested patch will show a few sickly hills the first season; small patches here and there dead the next season, and the patch rendered worthless the following spring. A condition that is becoming quite common, however, is for the patch to be materially weakened the first season, and the second season, when it is expected to yield a full crop, the patch is absolutely worthless.

Two factors make this condition possible. The soil is often infested with grubs even though strawberries have not been grown on the ground previously. Again, the beetles from infested beds all about tend to concentrate on the new patch.

HOST PLANTS—While the root weevil is a pest of the strawberry it is by no means confined to this host plant. Both the larvae and the beetles have a wide and varied list of host plants to their credit. The raspberry, blackberry and loganberry may be attacked, but it is not believed that the weevil will prove a serious menace to these hosts. There is a list of seventy host plants for adult beetles and thirteen host plants for the larvae.

There is a statement abroad that the root weevil of the strawberry affects clover and therefore it is dangerous to plant strawberries on land that has grown clover. According to Professor Lovett of Oregon, who has made quite a study of the weevil, and also Dr. Melander of Pullman, this is not true. Clover is affected by a root weevil that is very similar to the strawberry root weevil, a near relative to it. However, this clover weevil will not feed on the strawberry.

HERE are short descriptions of the beetle and the larvae. The adult weevil is a snout beetle nearly one-fourth of an inch in length. The color of the insect varies from a dull reddish brown, when freshly emerged, to almost pitch-black. The surface is roughly pitted and slightly shiny. The beak is short, broad and emarginate at the tip. There is a distinct puncture between the eyes, the antennae are elbowed and consist of nine segments.

The larvae, when seen eating, were of a pinkish tinge, but when compelled to fast, became white. The full grown larva is three-eighths of an inch long by one-eighth of an inch wide, white in color except the

head, which is light brown. The body is arched.

The strawberry root weevil is single brooded. The adult beetles remain alive and active for more than a year. There are for a short period of time, two generations of beetles present. These are busily engaged in feeding on the foliage of the strawberry, and other hosts, ragging and stripping it. The insects pass the winter in both adult and grub stage.

The beetles pass the winter in all conceivable sorts of places. Many hibernate in the soil close about the crown of their host or crowded down into the sheaths about the central whorl of the crown, also under heaps of debris about the field and fence corners, or under boards and loose bark. The more mature grubs pass the winter in the soil about the roots of their hosts. The majority pass the winter as nearly mature larvae, feeding to a limited extent on their hosts.

The beetles feed at night, and during the day crowd down in the dark sheltered places. They will often be found in numbers under a clod, in a crevice or crack in the soil, or crowded down about the crown of the plant itself.

CONTROL MEASURES—In spite of a great amount of careful and conscientious investigation in Canada and in Oregon no really practical and satisfactory measures have been developed. Taking into account the inability of the beetles to fly, the idea of a barrier about the newly set field to keep them out was thought of. The barrier used consisted of twelve inch boards, placed on edge about the field, well braced from the inside, all the joints carefully fitted and made insect-proof. A strip of tin was tacked along the top edge of the fence projecting out over the edge about one and one-half inches.

The barrier proved reasonably effective in excluding the weevil and although the cost of construction is considerable, the idea is not impracticable. This plan has never proved popular with the growers.

The crop rotation plan, which is recommended by the Canadian and Oregon workers, seems the only one at present feasible. It is that of growing the plants only one full crop year and then destroying the field immediately after the harvesting of the main berry crop. Plant in the spring and cultivate the first season, take one crop the second season and plow up the field just as soon as the berries are off. Plow in mid-summer after the beetles have laid their eggs and also burn the strawberry plants so the larvae will not have anything to feed on. If plowed before this time the beetles will go to another patch in order to lay their eggs. It is also a good idea to have chickens in the patch while plowing.

We have observed that the weevil is more apt to be present on high ground than on low places. Previous to planting, dip plants in a tobacco solution, consisting

of four tablespoons full of black-leaf-40 and one-fourth pound of soap dissolved in five gallons of water.

Dr. Melander of the State College, at Pullman, tried drowning the weevil; burning out the insects; killing by contact with insecticides; soaking the ground with strong soap suds, oil emulsion, and solutions of borax and copperas; by using poisonous fumes and gases as chlorine, sulfur-dioxide, acetylene, and gasoline, kerosene, turpentine, chloroform, etc., but none of these treatments seem effective and, in many cases, the plants were killed.

OF THE soil fumigants the cyanide gas and the carbon-disulphide killed enough insects to give promise. The cyanide was discarded because it destroyed the plants and because it is one of the most dangerous of poisons to man.

The carbon-disulphide was used by putting a couple of tablespoonsful in a saucer every three feet, under a piece of oil cloth or canvas made gas proof by painting with linseed oil or other material, and covering about six feet of the infested row. This liquid evaporates quickly and the fumes, being heavier than air, sink into the soil. As they are poisonous the fumes destroy the grubs and the beetles also. Cover the edges of the canvas with dirt and leave covered for six hours.

In many cases last spring where the weevil was quite serious we advocated the use of nitrate of soda to insure the growers a crop of fruit. Our idea was to prolong the life of the plant. We also used a chemical known as paradichlorobenzol which is used in combating the peach borer. It seemed effective in a small measure and in some cases where it was applied the plants seemed healthy and more vigorous and we could find no weevil. In other cases we found the grubs inactive and of a darker appearance. On further study of the chemical, we learned that the crystals did not give off their gas under wet conditions and perhaps it would be more effective in sections where the climate is drier.

CROWN MINER—This pest is a small worm that works entirely within the crown of the strawberry plant, constructing its tunnels there, and burrowing about. The worm is slender and pinkish in color with a brown head. The adult is a small moth. For its control plowing up the infested plants is the method recommended.

STRAWBERRY ROOT BORER—The root borer is a serious pest to the strawberry. The larvae are white and elongated, with a brown head. They feed on the interior of the crown and the tap root of the plant, eating out the entire heart. The plant, as a result, looks sickly and when pulled up will often break just below the crown, exposing the tunnel and often the larva itself.

The adult insects are clear-winged moths. Dig up and destroy infested plants, preferably in late fall or early spring.

(Continued on page 25)

Cherry Fruit-Sawfly and Its Control

By W. P. DURUZ

Division of Pomology, University of California

THE cherry fruit sawfly, *Hoplomampa cookei* (Clarke) does considerable damage to cherries and plums in certain fruit districts. The insect has not spread rapidly, so control measures have not been very urgent. Severe loss, however, has occurred at times to a few California growers, and it is necessary to have a full understanding of the insect and the latest remedies that will check any outbreak in the future.

F. B. McKevitt, Jr., of Vacaville, experienced great loss in his plums from the cherry fruit sawfly in 1920, and it was at his suggestion that a study of this insect was undertaken, with a view of working out a satisfactory control. He generously volunteered the use of his orchard and made spraying treatments as suggested. This is a report of the one season's work, which has revealed the habits of the insect and some points, thought valuable in controlling it.*

NATURE OF INJURY—The larva of the cherry fruit sawfly attacks the small fruits of the cherry, (sweet and sour), plum and prune, and, occasionally, apricots and peaches. It also feeds on wild plums and willows. Mr. McKevitt describes the injury as follows: "The plums were apparently all right until they were about as large as peas, when they turned yellow and dropped off."

The presence of the larva is first apparent from a dark decayed area on the very small fruit (Fig. 1). On cutting open one of these fruits, the small whitish slug-like larva is revealed. It is from one-eighth to one-fourth inch long, always rests in a curved position and feeds on the kernel and much of the fleshy portion of the fruit. If the kernel is hard, only the flesh is eaten.

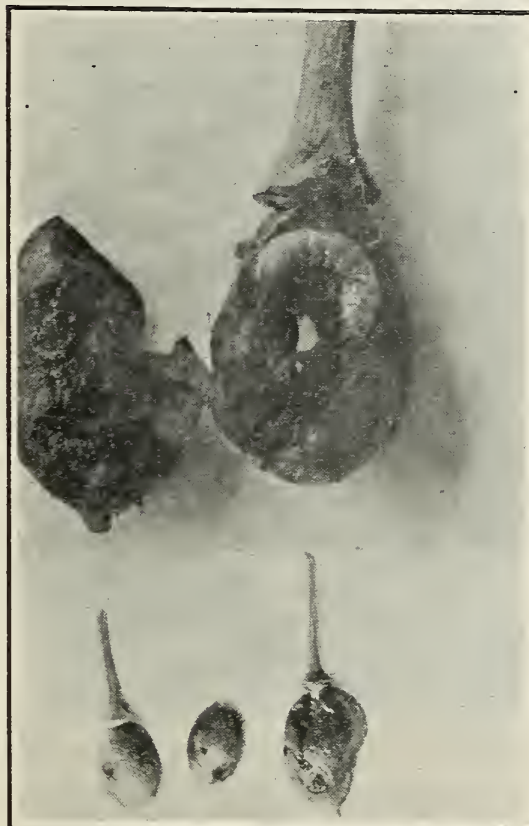
The injury is even more noticeable from the clean round holes bored into the fruit by the larva in entering and going out of the fruit (Fig. 1). One larva may injure three to four fruits and cause a loss of from fifty to ninety per cent of the crop. Mr. McKevitt estimated his loss in 1920 at \$3,000 on Diamond and Grand Duke plums alone.

DISTRIBUTION—According to Professor Essig† this insect is distributed throughout Central California and as far north as Southern Oregon, where it has been found in the Rogue River Valley. The insect was first found in Suisun Valley, by Matthew Cooke‡ in 1883. The writer has found this insect in plums and cherries in the McKevitt orchard and at the Bucktown ranch at Vacaville.

LIFE HISTORY OF THE ADULT—Foster§ states that the female sawfly appears in the spring about the time the

early varieties of sweet cherries—Chapman, Black Tartarian, etc.—are beginning to bloom. The adults are mostly black with yellowish or reddish-brown appendages. They are about one-eighth inch long, with broad body and have two pairs of well developed wings. They are usually quiet, especially early in the morning, but as the atmosphere becomes warmer toward noon, they flutter about in the trees in search for places to lay their eggs.

THE EGG—Egg laying (in the Suisun Valley) begins about March 20. The eggs are laid by the females in the sepals or upper part of the calyx cups of the expanding blossoms. The sharp ovipositor or "saw" is used to make the incision in the tissue and for placing the eggs. The eggs



Above: Larvae of cherry-fruit sawfly feeding on cherry fruit. The kernel has been eaten. Below: Plums damaged by sawfly larvae.

are usually deposited singly just before the petals open.

THE LARVA—The time of hatching of the larva coincides closely with the falling of the petals from the blossoms of the variety attacked. Upon hatching it soon finds its way to the bottom of the calyx cup and eats directly into the newly formed fruit and devours the kernel, which it prefers. The fruit thus injured turns yellow and withers. The larva then attacks a second fruit, entering it any place on the surface and, as in the first attack, eats out the kernel if it has not hardened.

The second fruit, being larger, usually withstands the effects of feeding longer. The growth, however, is checked and it

gradually turns a pale green color and hangs on the tree (Fig. 1) for some time. A third and sometimes a fourth fruit may be attacked in this way. One larva usually destroys three fruits while some attack four.

When full grown the larva leaves the fruit and makes its way to the ground, where it pupates.

THE PUPA—Foster states the following, relative to pupation: "The larva constructs a small parchment-like cocoon which is found three to seven inches below the surface of the ground. The outer surface of the cocoon is covered with fine particles of soil, giving it the appearance of a small clod of dirt. The larva remains as such in the cocoon until the following winter. Some time after the winter rains begin it transforms to pupa and emerges the following March as an adult. The pupa has not been observed. There is only one brood each year."

CONTROL EXPERIMENTS—P. J. O'Gara†† of Medford, Oregon, had conducted experiments for three years which led him to state in 1913 that two to three applications of arsenate of lead would control this insect. Mr. Foster recommended spraying with a three per cent distillate-oil emulsion, to which had been added nicotine sulfate at the rate of one part to 2000 parts of water, same to be applied in the early mornings when the adults are on the trees, but very sluggish.

These are the only suggestions ever published on control measures.

AS HAS been stated, Mr. McKevitt offered the use of his plum orchard, which was known to be infested with this insect. The trees selected were about 25 years old and of the Diamond and Grand Duke varieties. Nine blocks, of twenty trees each, were selected, and each block given a different spray treatment, (see table). A power sprayer was used and the spray applied with spray guns.

Counts of infested and non infested fruits were made throughout the different blocks. Obviously, all the young fruits on such a large number of trees could not be counted in the time available, so careful estimation was used to supplement the actual counts. Casual observations of interested persons coincided with the counts

(Continued on page 24)

*The writer is indebted to Messrs. F. B. McKevitt, Jr., and George Allen for their hearty co-operation and assistance in conducting this investigation.

†Essig, E. O., *Injurious and Beneficial Insects of California*, Monthly Bulletin State Commission of Horticulture, Volume IV, No. 4, 1915.

‡*Injurious Insects of Orchard and Vineyard*, pp. 137-138, 1883.

§Bulletin 116, Part III, Bureau Entomology, Department of Agriculture, 1911.

††*California State Commission of Horticulture*, Monthly Bulletin, Volume, III, No. 1, pp. 31-35.

Crown Gall, Its Causes and Cure

ROOT knot, crown gall, or black knot that affect all stone fruits and nuts and even apples and pears, seem to be native to many of our soils. There are numerous instances of crown gall in nurseries on land where tree have never been grown before. No nursery on the coast can boast of having never had a knotted tree, though no affected tree is knowingly permitted to go out for planting.

The black knot on the vine is said to be the work of the same species of bacterium that produces tumors on peaches, almonds, etc., and is found all over the world, on many kinds of trees, bushes, vines and plants. In vineyards the aerial form is not infrequently found growing on one-year wood, and this is attributed to injury from early frosts and the infection entering the cracked bark. On trees, as every one knows, the galls that we have learned to dread are those that occur near the surface of the ground, or on the main roots near the surface.

In an excellent discussion of the disease in the *Sunsweet Standard*, M. A. Benjamin tells how to go about curing it. The grower should dig down around his trees where conditions of growth indicate trouble, looking for root-knot just in the same way as he does for borers. It is only on the crown or the main roots that work is applied—don't bother about any knots that may be on roots away from the tree. When gall or root-knot is found, cut it out with a chisel or gouge, cutting down in the center till a concave is formed, because it seems to go down to a core like a corn.

After having been thoroughly cut out clean and the chips cleared away, the wound is disinfected with a strong creosote and then painted with a good stiff roofing paint. The aerial form, that is galls appearing on the trunk or on the branches above the ground—are always easily destroyed, but the others need more attention later in case of reinfection.

Those trees whose habit it is to be shallow-rooted have shown themselves to be more susceptible to root-knot. This may be because the roots are more easily subject to injury from plow or cultivator than those rooting deeper. It is suggested that a good many galls appearing just below the surface are the result of injury by gophers, the gall bacteria entering through the wounds so made.

While infection undoubtedly takes place during the dormant season, it remains latent till growth starts in the spring and the galls form during the actual growing season. The rate of the growth of galls as well as the appearance of new galls is proportionate to the growth the trees make.

There seems to be a steady rise in the rate of appearance of new galls from the first to about the sixth year; a slackening of the pace for a couple of years following,

with a possible decline in later years, when the rate of growth is decreased or it comes to a standstill. It should therefore be possible, by removing the galls from the trees, during the first eight years or so, during which nearly all their growth is made, to ultimately reach a condition when there would be so few new galls coming as to be every year for good results.

As for reinfections, while these do occur, the low rate of their appearance, something like ten per cent, is not such as to warrant great concern.

A lower rate of reinfection might be obtained by using some soil stimulant containing copper sulfate, which has been successfully used by the writer. This will have to be used with caution.



Tree from which crown gall has been thoroughly chiseled out.
(Courtesy *Sunsweet Standard*)

CROWN gall bacteria cannot enter into perfectly sound tissue and infect it. There must be a wound or abrasion—no matter how small. It is hard to account for some galls on the basis of mechanical injury. Most of those one finds are apparently traced to bruises caused by overlapping roots galling one another so as to expose interior bark. Judicious pruning of the roots at planting time will help reduce this risk.

The practice of leading water to the base of trees with a shovel is to be deprecated. There are no feeding roots there to render it necessary and there is danger of injury to the tender bark of the roots through which infection may enter, the moisture aids in the production of fungus and bacteria.

In treating some trees for crown gall, it is necessary, in cutting it out, almost to

girdle the tree and when this is done it is best to bridge graft. When doing this you are supplying the upper part of the trees with nourishment.

The important step in bridge grafting is preparing the wound to receive the grafts. The injured parts should be thoroughly cleansed, all dead tissues cut away and the cleansed surface should be treated with creosote and then painted. The irregular edges of the bark should be cut back evenly.

The scions which form the bridge should be selected from wood of the previous season's growth. Either branches which grew the preceeding season or water sprouts that are only one year old may be used.

It is important that the scions should be a little longer than the space to be bridged. This is in order that the middle portion of the scion, when put in position, shall arch slightly over the central part of the wound.

Before being placed in position, the scions are beveled at each end, both surfaces being on the same side of the scion. This beveling should be done with a long, sloping cut, so that the wedge-shaped ends thus formed will be relatively thin, to permit their being thrust well under the bark without danger of separating it unduly from the cambium at the points of insertion. The placing of the scions in position is facilitated if the bark at the margins of the wound is slit for a short distance at the points where the ends are to be inserted.

The number of scions required for a bridge will depend largely upon the size of the trunk. No fixed rule can be given. The larger the number the more complete will be the restoration of the connection between the parts above and below the wound, but if placed too close together the bark at the margins of the wound between the scions will be raised. The starting of the bark except at the immediate points of insertion of the scions must be avoided.

In placing the scions it is of the greatest importance that the cambium of the scions which are exposed in the sloping cuts at the ends be brought into intimate contact with the cambium that lies under the bark at the margins of the wounded area.

THE union of scion and tree can occur where the cambium layers of the two come together. The scions may be secured in their proper position, if need be, by driving a very small nail through each end into the trunk. This will aid in drawing the cambium of scion and trunk closely together. The operation is completed by thoroughly covering the area occupied by the ends of the scions and the margins of the wound with grafting wax, strips of waxed cloth, or by some other means that will adequately prevent these parts from drying out.

If the wound is mostly below the surface

(Continued on page 27)

Shipping Point Inspection of Potatoes

By W. H. WICKS,

Director Bureau Plant Industry and Acting Director Bureau Markets, Idaho Department Agriculture, Boise.

In view of the fact that fruit and vegetable growers of the country seem to have won their fight for general adoption of shipping point inspection of their products by the government, this article on the subject is considered timely and informative. Potato growers have been in the vanguard in working out with government bureaus satisfactory methods of conducting such inspection. The benefits to this industry have been many, as Director Wicks here sets forth from experience with the inspection service in Idaho.

ON JULY 1, 1921, the Idaho State Department of Agriculture consummated a formal agreement with the Bureau of Markets and Crop Estimates, U. S. Department of Agriculture, pertaining to standardization and inspection work.

The objects of this agreement are: (a) To aid in the improvement of existing standards for fruits and vegetables and to establish standards for fruits and vegetables not already standardized, giving due attention to the desirability of establishing, so far as practicable, such standards in conformity with those promulgated, recommended or proposed by the Department of Agriculture of the United States. (b) To develop further the shipping point inspection service in the state of Idaho, with special reference to the co-ordination of such work with the food products inspection service, now conducted in central markets by the United States Department of Agriculture.

The method of procedure consists of the employment by the United States Department of Agriculture, of a supervisor inspector, who works with the director of of the Bureau of Plant Industry, Idaho Department of Agriculture, in developing the Idaho shipping point inspection service in accordance with the general policy of the United States Food Products Inspection Service. The Idaho Department of Agriculture must approve no permanent changes in existing horticultural laws without consulting the Federal Bureau of Markets and Crop Estimates.

From this agreement it is seen that state grades and standards are promulgated in harmony with federal grades. This arrangement makes it possible for shipping point standards and certificates used to be practically the same as those used by the Federal Bureau of Markets and Crop Esti-

mates in making inspections and transacting their work in terminal market inspection points. This co-operative agreement has done much to overcome the undesirable features of state shipping point inspection during 1919 and 1920.

CROP AND DATA INSPECTION RECORDS—Using figures of the Idaho Crop Reporting Service, we find that the potato crop of Idaho for 1921 was placed at 10,545,000 bushels. This crop was produced on 57,000 acres with an average yield of 185 bushels per acre. Allowing 90 cents per bushel as the average market price for all varieties, the potato crop had a valuation of \$9,490,500.

In point of production Idaho is out-classed by Maine, New York, Pennsylvania, Michigan, Wisconsin and Minnesota, in the order given, placing Idaho seventh. In point of average yield per acre, Idaho is exceeded only by Maine, while in 1920 the two states tied at 180 bushels per acre. The average for the United States is 109.6 bushels.

The four states now having state and federal co-operative shipping point inspection are Washington, California, Colorado and Idaho. Comparison of estimated production and the rate of inspections up to December 1 is interesting. The carlot figures are:

State	Car Shipm'ts	Cars Inspected	Per Cent Inspected
California	3423	400	11
Colorado	7844	7500	95
Idaho	6672	6156	92
Washington	2964	800	26

Production of these states may prove interesting. The 1921 figures, in carloads, are these: California, 8419; Colorado,

18,000; Idaho, 10,500; Washington, 6,000.

We call attention to the fact that Colorado has a compulsory law which makes it necessary that all cars carry a certificate, while inspection is optional in California, Washington and Idaho. Of the three states maintaining optional inspection, Idaho ranks first, having secured 92 per cent inspection for all cars moved up to December 1.

POTATO GRADES—The Idaho official grades for the sale and shipment of potatoes are those established by the U. S. Bureau of Markets and Crop Estimates. These grades are: U. S. Grade Fancy; U. S. Grade No. 1 and U. S. Grade No. 2. These government grades are now also being officially used by Washington, Oregon, Utah, Colorado, Nebraska, Oklahoma, Texas, Minnesota, Ohio, North Carolina and New Jersey.

Idaho's record on grades since the inspection was inaugurated has been this:

Grade	Per Cent		
	1919	1920	1921
U. S. Fancy	0	0	.99
U. S. No. 1	90.9	92.02	86.18
U. S. No. 2	6.4	5.08	9.54
Comb. Fancy & No. 1	0	0	.17
Comb. Nos. 1 & 2	0	1.18	2.9
No Grade	2.7	1.06	.22

HOW INSPECTION IS CONDUCTED—Shipping point inspection is offered by the State Department of Agriculture at loading points only, where trained inspectors are maintained and there is a sufficient tonnage and demand for inspection. During the year 1921 shipping point inspection

(Continued on page 18)



Loading potatoes at one of the 128 inspection points maintained in Idaho under joint federal and state management last year.

Growing Apples in Willamette Valley

By B. N. JOHNSON

Manager Oregon Apple Orchard Company, Monroe, Oregon

UP IN OUR section the natives long were prone to regard me as a "nut." They said I was crazy in head and that my associates had more money than brains if we thought we could raise fruit on those "squirrel lands;" that those red hill ranches were only fit for goat pasture.

During the past couple of years some of them are changing their tune, however. They have seen the fruit we are growing and some of them now say, "I always said them red hills are the best fruit soil in the world." I quite agree with them.

My observation leads me to the belief there are too many "doctors, lawyers, merchants, thieves," engaged in the business and not enough real honest-to-goodness fruit growers. It would be a good thing for the industry if a lot of them could be prohibited by law from further activity in the game.

We should not lose sight of the fact that raising apples is a highly specialized industry. Given the soil and climate necessary, production of the high grade apple is, to an extent, dependent on the attitude of mind of the grower. It is a mistake to attempt to grow corn and hogs, run a dairy, raise grain and 57 other varieties of farm products, along with raising apples. If you want to diversify, diversify with fruit. If you are going to stay in the game, raise fruit exclusively. Specialize on size and quality.

A man with an apple orchard of five acres or less invites disaster. A 10-acre unit should be the minimum for apples. Twenty acres would be better, and I am inclined to the belief that 30 or 40 acres of tree fruits—probably somewhat diversified—would be still better.

Another thing—apple raising is not a poor man's game. The trees should be pruned and sprayed and tilled each year, whether you have a crop or not. It is a dangerous undertaking to attempt development of an orchard unless one has the means or an income sufficient to defray the expenses of development up to the time the orchard comes into profitable production. This means 9 or 10 years in the Willamette Valley for an apple orchard, and at a cost of \$500 an acre in good American money.

Ten or 15 years ago we were handed a lot of bunk about being able to bring an orchard into profitable bearing in six years, at a cost of from \$150 to \$200 an acre. It can not be done. That is why a lot of growers have become discouraged.

As a general proposition, I maintain that apples of size and quality can be grown in the Willamette Valley at a profit. Too much care can not be exercised in selection of the land for an orchard. Before

Here are presented salient features of a meaty practical paper read before the annual meeting of the Oregon State Horticultural Society. It is a matter of some regret that other excellent points touched upon by Mr. Johnson can not be given space here. From his experiences, for instance, he has come to be a strong advocate of early picking and shipping. His paper quoted at length from other authorities by way of driving home the value of almost ruthless thinning. It is important, in reading of results he mentions, to have in mind the fact that most orchards in irrigated sections have nearly twice as many trees to the acre as do the Willamette Valley orchards.

we planted ours we had several thousand acres under option and before the purchase of any land we had it examined, bored and tested by a soil expert from the agricultural college—Professor H. D. Scudder. We followed his recommendations in the purchase and subsequent planting of the land, and since then have been impressed with the wisdom of this course.

I can not give the growers any hard and fast rules to follow that will insure the raising of good fruit. Each grower has his individual problem. Soil conditions and pruning methods vary. Uniform orchard practices are not followed.

DURING the past four years we have experienced little difficulty in developing size, color and quality. This required attention to five important details—pruning, spraying, fertilization, tillage and thinning—with emphasis on the last two, tillage and thinning.

Without plenty of light and air, apples will not set well nor color properly. Hence it is important that trees be kept open by means of intelligent pruning.

We follow the spraying program as outlined by the specialists at Oregon Agricultural College. Most of our spraying is done with outfits using 300 pounds pressure or better, and at the proper time. We applied seven sprays during the past season. Our warehouse foreman informs me that our culls did not exceed three per cent of the crop.

Cover crops and artificial fertilizers, preferably both, must be systematically used if best results are to be obtained. Plowing, two double discings and two or more kimbarrings or harrowings constitute

a minimum tillage program. Years when plowing is omitted, a third double discing might be added with good results.

At Monroe we do not follow any hard and fast rule in thinning. While six inches is a general gauge to follow, the variety the condition of the individual tree, as well as the set of fruit, are all factors to guide one in thinning operations. During our thinning season we had as high as 75 persons working, at a cost of \$2522.64.

Always take off the undersized fruits, regardless of their position on the tree, is one safe rule to follow. If an apple is perceptibly small at thinning time it is almost certain to be in the five-tier class at packing time. Thin early, thin thoroughly and always thin off the doubles and the little ones.

We took off easily 75 per cent of our Ortleys last season, and yet many of the trees were overloaded. Always thin heavily on Jonathans and Grimes. These varieties tend to grow small and the trade does not want the small ones. While 10 per cent of 175s and smaller will usually be accepted, many orders received by us last season provided for 163s and larger, no five-tier stock being wanted.

WE HAD one block of 60 acres of apples which show a net profit of \$75 to \$100 an acre for the season. It is planted to Kings, Spys, Newtowns and Ortleys. It produced between 12,000 and 15,000 boxes of fruit. On this particular section the tillage was \$5.20 an acre; spraying \$17.95 an acre, including cost of spray materials; pruning, \$16.25 an acre, and thinning, approximately \$12 an acre.

Including overhead and miscellaneous expenses, the cost of producing a crop on this section will run about \$60 an acre. We estimate the tree-to-car expense at 60 to 65 cents per box. Based on a crop of four boxes to the tree, or 200 boxes an acre, at 60 cents per box, we have a tree-to-car expense of \$120 an acre and a production cost of \$60 an acre, making a total of \$180 an acre, or 90 cents a box, for all grades and varieties.

Cost of production, including physical handling, should not exceed \$1 per box, and ought to be kept down to 75 cents per box as production increases.

In this connection I would strongly advise more attention to the production of apples of size and quality. If it is going to cost 75 cents to \$1 per box to get our apples grown and loaded on cars, no financial expert is required to show us that we are losing money on nearly every box of C grade or five-tier apples we ship. In my judgment, the best thing that could happen the industry here would be the definite

and immediate refusal of the trade to accept our small apples at any price.

It would be far better for all of us if we could build and operate large by-products plants in every producing section in the Northwest. The plants should have capacity to convert all of our C grade and

five-tier apples into cider, vinegar, jelly, jam, dried apples, and the like, at a normal price per ton. Such action would restrict the output of the Northwest probably 50 per cent, and would go a very long way in stabilizing the market and insuring to growers a good margin of profit.

Practically all of our extra fancy apples brought \$2 to \$2.50 per box f. o. b. shipping point the past season. At these prices we ought to make a satisfactory profit providing we are growing a large percentage of extra fancy and fancy grades, and have a

(Continued on page 22)

International 8-16 \$670 f. o. b. Chicago and a P & O 2-furrow Plow FREE

The free Plow offer expires May 1.

TO every farmer who buys, for delivery before May 1, an International 8-16 Tractor purchased by one of our dealers on 1922 account, we will give a P & O 2-furrow plow—or tractor harrow if he already has a plow. He will pay only \$670 f. o. b. Chicago, for the tractor, and the plow or harrow will be given him absolutely free, f. o. b. Chicago.

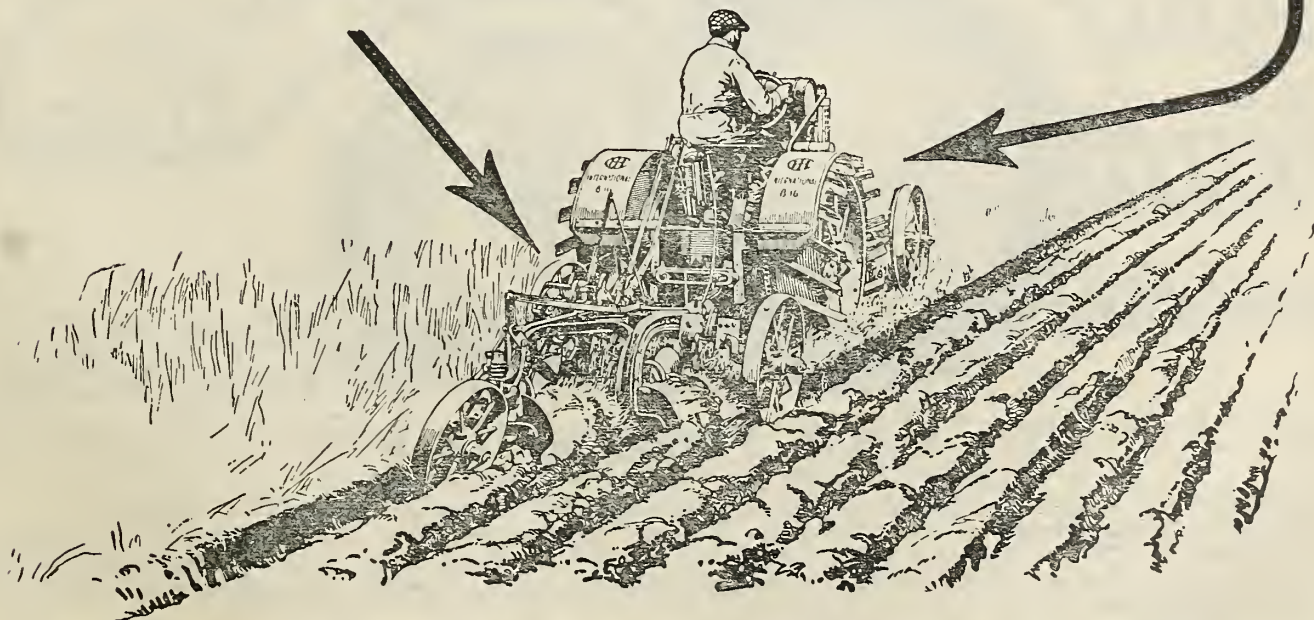
The International 8-16 is not a stripped tractor but sells complete with this equipment—belt pulley, fenders, platform, throttle governor, adjustable drawbar, angle lugs, brakes. More than \$100 worth of essential features, not to be paid for extra but included in the new low price.

The famous Titan 10-20 Tractor now sells for \$700. Until May 1 this Company will give with each Titan, covered by the Special Offer, a P & O 3-furrow plow Free. Tractor and plow f. o. b. Chicago. Remember that the Titan is a 3-plow tractor, with belt power in proportion. The Titan has proved it will outlive two or three small inferior tractors. Figure that you get all these things—free plow, all equipment, reserve power, extra long life, a tractor unequalled for belt work—for \$700.

The free plow offer ends May 1. If your order has not yet been placed we urge immediate action. See the McCormick-Deering Dealer.

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Some Phases of Apple Marketing

By H. H. MAYNARD,

Economics Department, Washington State College, Pullman

THERE are certain fundamental marketing functions that must be considered and no method of selling can be adopted which will eliminate any one of them. The buyer and seller must be brought together. Whether or not this can most efficiently be accomplished by a broker, working under the direction of a local sales manager, or an individual grower, is an open question.

Both methods have met with some success in the apple country in the past and both have certain admitted weaknesses. Certain it is that the broker must be used. Just how he may be used to the greatest advantage is a question.

My study leads me to believe that the use of a large sales agency which deals in all kinds of fruits and vegetables and can therefore keep its salesmen or brokers busy the year round is the best plan for most co-operative associations. Many large growers could use this type of agency directly and others would do better to use it through the local association.

It is possible that this can be most efficiently be accomplished by means of a sales agency, owned by the farmers themselves similar to the method used by the wheat growers. This plan is being suggested and investigated by the National Farm Bureau. There are many difficulties in the way of the successful operation of such a system. Many of these problems are faced by no other type of farmer.

The wheat grower of the Northwest is essentially like the wheat grower of Kansas or Dakota; that is, he is pretty much the same kind of man racially, economically, educationally and socially. The same is true of the big stock men of the country

and of the corn and cotton growers. But it is not true of the fruit growers of the United States.

The man who raises early vegetables on the east shore of Virginia or in the Rio Grande valley of Texas, is not the same man who raises cantaloupes in the Imperial valley, citrus fruit in California, or apples in Washington or Oregon. He has a different racial history, different standards of living, and a different background in general.

It is a vastly more difficult thing to get these men together in co-operative enterprise than it is a few wheat men. Yet that is just what would have to be done if a growers' sales agency were to be successful. It must compete with the big sales agencies now organized to sell apples, fruits and vegetables. These agencies either own orchards and gardens in all these and many others sections or they represent growers or growers' associations in these widely different sections. Perhaps these varying nationalities and types could co-operate in the maintenance of a sales agency, but the history of the co-operative movement indicates that it would be almost certain to result in failure.

My conclusion on this point is that growers who wish to sell to other than cash buyers will do well to join a local co-operative association, being careful to retain control of the association in hands other than those of the sales agency, and then sell through one or the other of the two big associations or sales agencies. Many men prefer to sell for cash. The cash buyer is present to accommodate them and, in my opinion, always will be on hand.

HERE is another phase of the marketing problem. There have been certain weaknesses in the industry, due to the pre-

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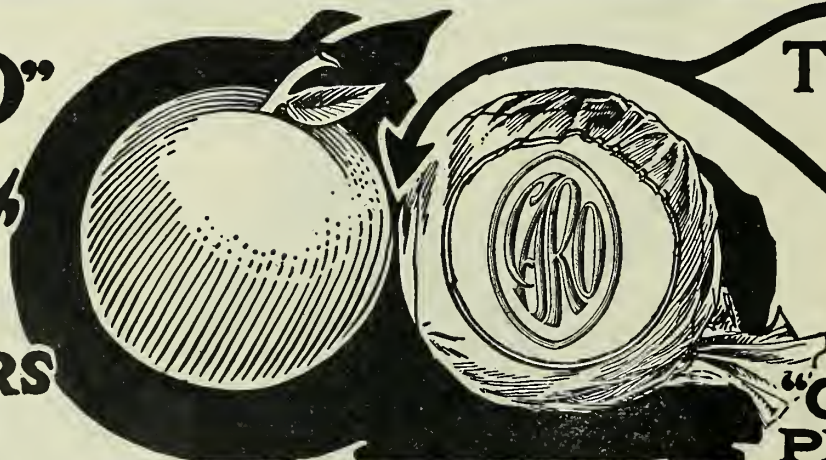
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IN 24 HOURS.**

"CARO"
fruit
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"CARO"
PROTECTS

"Caro" Protects—"Caro" Prolongs the Life of Fruit—Why?

CHEMICALLY TREATED, "Caro" from DessiCARE (to dry up)

FRUIT MATURITY is retarded by cold or refrigeration and hastened by heat or atmospheric exposure.

The soft fibrous silk-like texture of "Caro" provides just sufficient ventilation to retard the ripening process.

FRUIT DECOMPOSITION starts from a bruise which opens tiny holes and permits juice to escape and BACTERIA to enter. "Caro" clings closely and dries up the escaping juice. "Caro" ingredients harden the spot, kill the BACTERIA, arrest the decomposition.

United States Distributors, AMERICAN SALES AGENCIES CO., 112 Market Street, San Francisco, California

valence of too easy credit. Certain marketing factors have made a practice of advancing cash and supplies to the growers in order to secure control of their crop and be sure that it would be sold to them when ready to pick, pack and ship. The result is that growers have spent too much money during the growing season. They have not had the hand of necessity in a position to restrain them.

These growers have been optimistic and have spent this money in anticipation of repaying it from the returns from their apples in the fall and having a good surplus besides this left, on which to live the following year. When fall arrives they find their returns less than they had anticipated, for fruit growers know that this is much more liable to happen than the reverse. They find, in fact, that they have used up most of what their apples really brought them in net returns, during the summer. The only thing for them to do is to repeat the process and all too often the result has been the same year after year.

In the past the cash advance system was perhaps the only method of financing open to the growers. But now this is no longer true. The Federal Reserve system has provided for making growers' paper eligible for rediscount, when properly secured, and has provided for making the growing crop on the trees this security.

The grower can now go to his banker, get the cash he needs and be able to pay cash as he goes. He can pay cash for his orchard supplies and for his household and other expenses and, in the majority of cases, he can get better terms and prices than he time comes he is free to sell wherever he ever got from the cash buyer. When selling can get the best offer. He can use any one of the methods of selling which are open to him. He is on an open and above-board business basis, and can reap the profit of such a position.

Of course, this means that he must go to his banker with his statement of condition and with his crop estimate. In the past all too many farmers have been unwilling to do this. But it is hoped that the apple growers will cultivate a frankness in their dealings with their banker advisers which will permit them to go to them with their needs for financing and be taken care of on a business basis.

I believe that the cash buyer has a place in the industry, but I believe that this place is not connected with granting credit. Many growers prefer to sell for cash and to know that they will have the cash when the fruit is delivered. They also are willing to take less, if necessary, than they could secure elsewhere if they can have the cash and know just how much it is. They want to know how much they can depend on; how much they will have for new machinery; how much with which to buy additional land or an automobile, etc. These men, therefore, need to have a chance to sell to the cash buyer.

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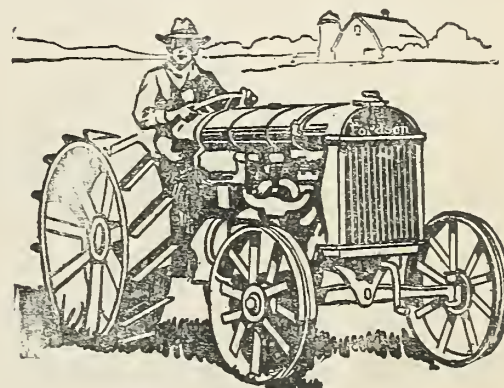
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Others are not speculative in their make-up. They prefer a sure thing in the fall to a chance of more returns in the spring or summer. Hence they throw the burden of the speculation on the shoulders of the cash buyer. If he carries this he must have an adequate return. Hence I believe that the cash buyer is an important cog in the marketing machine.

THE need for co-operative advertising cannot be too greatly stressed. People in the east must be made to see that the western apple is a quality product! that it is a staple and not a luxury. They must be made to see the superiority of the western boxed apple over the barreled product. They must be made to realize the value of the apple as a food. These

things and many others can be accomplished by advertising.

The Skookum, Hood River, and Big Y growers have done a great deal to accomplish these objects in the past, but the task is too big for any small group of growers such as these. They must have the help of the entire industry. This can be brought about by a co-operative campaign participated in by the growers of the Northwest without regard to what particular channel they choose for marketing their fruit.

It is time for the growers of Hood River to forget that they think they have the best apple on earth, and for Yakima and Wenatchee to do the same thing and get together for the good of the industry. It is time for the cash buyer to forget his jealousy of the co-operative association and for both of them to quit knocking the consignment house long enough to contribute to this campaign.

Apple production in the northwest is increasing. The time is coming when it may be difficult to market the fruit produced unless a corresponding increase in demand is created through advertising.

What, for illustration, would have happened to apple prices this year if frost had not destroyed most of the barreled crop? Stop and think of that question and then realize that the time is now here when the entire industry must get together to develop its market both at home and abroad.

Grafting Wax

By A. B. CLOUGH

CALIFORNIA walnut grafting wax is now being strongly recommended by horticultural experts, for use in orchard work of the northwest. In trials on walnut trees in California, where it got its name, it has proved more satisfactory than any of the other kinds. In the northwest it is also being used on deciduous trees, such as the apple, peach, pear, etc.

This preparation is now a little more expensive than some of the others, but its ease and efficiency of application more than make up for the difference in original cost. It is usually heated in a metal container until it is possible to apply it by means of a common paint brush. This saves much time, as most waxes must be warmed by friction with the hand and applied in the form of putty.

It is used principally in cleft grafting, bark grafting, and whip grafting, where it is necessary to cover all cut surfaces, immediately after the graft is made. A covering of this sort effectively prevents evaporation of moisture, prevents decay or growth of fungi, and protects the wound from the entrance of harmful insects.

California grafting wax is easily prepared by using 5 pounds of rosin, 1 pound beeswax, one-half pound powdered charcoal,

and one-half pint raw linseed oil. Heat the rosin and the beeswax together in a container, remove the heat and add the charcoal. This will cause considerable effervescence, so care must be exercised to prevent overflow of the mixture. After this mixture has been thoroughly stirred add the raw linseed oil and allow to cool. When cool it will take solid form and must therefore be heated for application.

▲ ▲ ▲

Early bearing apricots, peaches and crab apples are being planted along the roadsides in some California districts to serve as windbreaks for the main orchard.

▲ ▲ ▲

You do a double favor by mentioning BETTER FRUIT when answering advertisements you find here.

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A Night of Frost May Cost You an Entire Year's Profit.

Jack Frost works fast. Today you may have promise of a tremendous crop and big profits. Tomorrow—you may be facing terrible loss. Investigate the possibilities of frost prevention—write us without delay.

More than \$75,000,000.00 are lost annually through frost damage to growing crops, according to the U. S. Department of Agriculture. This is a tremendous toll to collect from the growers of the country. It may hit YOU next. Be prepared. Take no chances. Equip your orchard with the

“BOLTON” ORCHARD HEATER

Safest and surest frost prevention method known. Generates heat quickly, and maintains the temperature above the freezing point for a long time. Economical to operate. SEND FOR BOOKLET B-5.

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By G. E. DAVIS

Sumner, Washington

THE big demand for loganberries and loganberry juice throughout the world has caused many growers to enter the field, which is a profitable one if properly understood.

The art of growing them is simple, if one has the knowledge. The two vital factors that enter into successful production of loganberries are soil and climatic conditions.

A good, well drained clay loam soil is well adapted to their culture. The ground should be thoroughly plowed and harrowed, ready for planting in April. When the tip plants are ready to dig, care should be taken not to get plants that are not well matured, as here is the reason so many young plants die.

The plants should be set 8 feet apart in the row, the rows 7 feet apart. That requires 775 plants per acre. The posts should be 7 feet long set $2\frac{1}{2}$ feet in the ground, 32 feet apart in the row. This takes 210 to the acre.

There are several systems of trellising logans, but the most practical one is where 3 wires are used, all on the same side of the posts. The lower wire is put 18 inches from the ground; the middle wire 3 feet high, and the top one $4\frac{1}{2}$ feet. The young canes are left on the ground during the growing season and, in fact, until spring, when the old canes are cut out and burned.

The young canes are taken one at a time, raised up over the hill to the top wire, then out four feet and down under the bottom wire and wound around, in the shape of a snail or else wound in the shape of a figure eight. This system gives a solid wall of fruit-bearing canes. Also, the berries are out where they can be seen. This is one thing that must be considered, as the loganberry has such short laterals it is very easy for the berries to be hidden from view, and the easier we make it for the pickers to find the berries the better it is for the grower.

Great care should be taken in picking, as one over-ripe berry in a crate soon starts to bleed, then mold and soon spoils the whole crate.

Just here is where many growers make their biggest mistake—in supervision of the picking. The old saying "Every picker needs watching" is pretty largely true.

If you grow good berries, pick them properly, and market them judiciously, they will net you a nice profit.

▲ ▲ ▲

"Lady Dryden," a Barred Rock hen belonging to Oregon Agricultural College, in the California egg-laying contest from December 14, 1920 to December 14, 1921, laid 324 eggs—a world's record for the breed.

Apples by Weight

IN RECENT years several fruit shipping organizations have adopted a system of sampling apples by weight in determining grades and sizes of apples packed for each grower.

The aim of sampling apples by weight is to speed up the movement of the fruit through the packing rooms, and to avoid the expense of repiling and checking which frequently arises in attempting to retain the identity of each grower's lot of loose fruit on the packing-house floor. A sample is selected from each lot of fruit received. This is graded and sized, and a record made of the weight of each grade and size in the

sample. The percentage relation of the total weight of the sample to the total weight of the lot is then applied to ascertain the weight of the various grades and sizes that make up the lot, and the grower is given credit for the total weight, classified as to grades and sizes.

Now the government has taken up the idea and has prepared accounting forms and data which will be of great service to those wishing to study or employ the new method. Details have been published in Department of Agriculture Bulletin 1006, on "Accounting Records for Sampling Apples by Weight."

▲ ▲ ▲

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VOL. XVI. NO. 10

Inspection at Source

Reports from Washington give indication that growers and shippers of the Northwest are at the point of winning their fight for inspection of shipments of fruit, vegetables, poultry, butter and other perishable products at loading stations instead of destination.

The measure that may bring this about was introduced by Representative Summers of Washington state. It was adopted as a part of the agricultural appropriation bill and, unless there be meddlesome tinkering, will be enacted into federal law.

Were shipping point inspection a new and untried thing, Congress might find some justification for turning down the idea. But it is far from being new or untried. The article in this issue of BETTER FRUIT on shipping point inspection of potatoes in the state of Idaho quite convincingly sets forth both the practicability and success of this method. It would be difficult, even for a United States senator, to read the benefits as summarized in the conclusion of this article and still have adequate justification for opposing the growers' plea.

The senseless losses and injustices involved in the present inspection system demand a remedy. This remedy has been evolved. Congress faces the duty of applying it forthwith, and the great army of growers and ranchers should stand by and see that the job is promptly accomplished.

Wage Problem

Consideration of wage questions has been to the fore of late in fruit growing circles. Adjustments are taking place and must have place in the grower's plans for this season. Manifestly, since the country has been experiencing a period of falling commodity prices for some months, the trend of wages has also been downward.

The real problem which now concerns fruit men is a question of how much reduction there should be in wage rates.

There are those who hold that the country will this summer return to pre-war conditions and prices. They argue, accordingly, that wages should be put back to the pre-war basis—back to the point where 20 and 25 cents an hour was considered equitable pay, for all ordinary labor.

There is error in this conclusion. The fundamental error lies in the fact that the country is no longer in a period of falling prices. Manufacturing and wholesale prices have passed low ebb. Minor revisions downward may yet be expected in a few lines, but they are only such as must come from the retailers. In the basic industries, including such things as steel, copper, sugar and fabrics, prices now tend upward and not downward.

Even the prices of farm products reached the bottom of the decline some weeks ago and now are stiffening.

The fundamental fact to be borne in mind—in which all economists concur—is that the country will not return to pre-war prices of 1912-13 at this time. Every period of high prosperity is followed by at least one secondary upward swing of prices. Not until after this

second swing has passed can the country expect pre-war conditions and prices. We have entered this movement, and the wise man will lay his plans accordingly.

It is both wise and just to recognize the fact that we have not returned and will not return—for at least 18 months or more—to a pre-war status. Disregarding the scales of skilled workers, the wages of common labor have now been deflated about far enough. Labor prices this season will be below those of last season, but to seek to force them too low will entail only dissatisfaction and trouble.

The Radiophone

Use of the radiophone has come into its own in the Northwest with a rush. At first considered rather lightly as something that should amuse and interest the mechanically inclined boy, it has quickly won recognition as a valuable invention of far-reaching utility.

It is partly true that the radiophone is still popular chiefly for amusement purposes. But, mark the statement, its commercial uses are to be very extensive and valuable. These are in their infancy, but will be developed with startling rapidity.

If the boy wants to install a radiophone receiving set in your back-yard give him fullest encouragement. In another year your neighbors will be receiving frost warnings, weather reports, market reports and no end of helpful and interesting information over the radiophone.

Use of the radiophone will become as universal as use of the automobile. Every orchardist will have one. Cost of installation is quite nominal—that is, for the receiving set alone. Scan our advertising columns if you are suspicious about this boost. We are not thinking even of the endless amusement and entertainment features you will enjoy. In suggesting that you install a radiophone at your earliest convenience we have in mind only its assured commercial value to you in protecting and marketing your fruit.

Skookum Affairs

THE SKOOKUM PACKERS' Association held its postponed annual meeting at Wenatchee the middle of March and elected I. H. Logue, president; C. W. White, first vice president; A. E. Munson, second vice president; Miss Grace Lanphere, secretary-treasurer; J. A. Warman, general manager and C. W. White, A. E. Munson, J. W. Terry, F. H. Phipps, B. W. Johnson and P. M. Martin, executive committee.

A resolution was passed providing for the disbursement of \$10,000 of the assets to the shipping units in proportion as this sum had been paid in. The Seattle advertising office was ordered discontinued, thus centralizing the work of the Skookum Packers' Association at Wenatchee. Disbursement of the \$10,000 fund, it is believed, indicates a change in the advertising policy and the intention of the growers to spend less for this purpose.

According to a member of the association, who is also a member of the new United Apple Growers, the United Apple Growers' concern will be abandoned and no attempt made by this organization to use the Skookum brand. The members of the Skookum packers have until May 1 to complete their cancellation as members and those not completing cancellation will ship through the Skookum association as last year. No unit, so far as known, has completed cancellation. The Northwestern Fruit exchange will handle all fruit of the association as it did last year.

Preventing Leaf Curl

INFECTIONS of the destructive peach leaf curl may be fully prevented by thorough application of Bordeaux spray between December 1 and the early part of February, according to most excellent authorities. By George L. Zundel, extension disease specialist with the Washington State College, recommendation is made that the spray be applied soon after the leaves fall.

"Peach trees are not bearing fruit at this time of the year," he says, "but to help secure a good crop for the next season, fall is the time to spray in order to control the

peach leaf curl. This caused considerable damage to peach orchards this past year, the attack being the most severe that has visited in several seasons.

"In the early spring the leaves begin to curl between the veins, take on a reddish hue and finally all fall off. This necessitates the tree putting out another crop of leaves, which weakens it, and, if repeated enough times, causes death to the tree. In most of the cases, no fruit will be produced. Fall spraying, just after the leaves drop, is best.

"To get maximum results, use a solution of Bordeaux with the strength of 6-6-50, or even 8-8-50. Spring spraying is successful, provided the spray is applied

before there is any indication of the opening of the bud, in other words—spraying must be done while the buds are dormant. This is a very easy disease to control if the spraying is handled properly."

California horticultural authorities have been warning automobile and truck transportation concerns with reference to the state law prohibiting the transfer of nursery stock from one county to another without notifying the county horticultural commissioner at destination.

▲ ▲ ▲

Latest edition of BETTER FRUIT just received. It is full of good things.—Luke Powell, Yakima, Washington.



FRUIT LABELS

Write today for
Samples and Prices
We welcome large
or small orders

The United States Printing
and Lithograph Company

Color Printing Headquarters

Seattle

San Francisco



DEPT. B.

Shipping Point Inspection of Potatoes

(Continued from page 9)

tion was available by authorized inspectors at 128 shipping points. Thirty-four inspectors were employed. Practically all demands for shipping point inspection on the part of growers or shippers were met with the exception of an occasional distant point where either the movement was too light or a satisfactory inspector could not be secured.

Uniformity of conducting the inspection service is maintained by the use of a book of regulations and instructions to inspectors. A chief potato inspector is employed, who spends practically his entire time giving personal aid to each inspector in the enforcement of these regulations and instructions. A supervising inspector of the U. S. Bureau of Markets and Crop Estimates works in conjunction with the Boise office and the chief inspector.

The fee for potato inspection per car in Idaho is \$2.50 and 1 cent per sack for less than one-half car lots. In Colorado it is \$2.50 per car; California charges \$5.00 per car and \$2.50 for half car lots or less. The rate is the same in the state of Washington.

At \$2.50 per car, 16,733 cars having been inspected from April 1, 1919, to December 1, 1921, the potato industry of the state has paid into the State Department of Agriculture in inspection fees a total of \$41,832.50. The fee is not sufficient to maintain inspection service most satisfactorily and should be increased to at least \$4.00 per car and preferably \$5.00.

OPTIONAL OR COMPULSORY INSPECTION—This is a decidedly debatable question. In order to secure the experience of the states operating under compulsory and optional inspection laws this question was asked of California, Colorado, Washington and Wisconsin authorities, with the following results:

California—F. W. Read, in charge of standardization service, reports:

"In my opinion, based on the experience we have had in this work, I would say that optional inspection is generally to be preferred."

Colorado—Wm. F. Allewelt, director Division of Marketing, believes in compulsory inspection, saying: "In my opinion, compulsory inspection is very much preferable to optional inspection, particularly when inaugurating the work in a new district. Honest, responsible, reliable growers and shippers, who take some pride in the product they put out and wish to maintain reputations for handling standard goods, are all strongly in favor of standardization and inspection."

Washington—Chas. L. Robinson, supervisor of horticulture, in reporting, states:



Casein Spreader & Adhesive

Kayso in your spray means a thin film of spray solution, spread evenly over every part of tree, foliage and fruit, giving complete protection against insect pests and fungus diseases.

Kayso is sold by all leading Pacific Coast dealers. Your local dealer should be able to supply you. If not, order direct or write for descriptive circular.

CALIFORNIA CENTRAL CREAMERIES

425 BATTERY ST.
SAN FRANCISCO

277 BROADWAY
NEW YORK

740 TERMINAL ST.
LOS ANGELES

"In my opinion optional inspection is most desirable under present conditions."

Wisconsin—The experience of compulsory inspection in Wisconsin, as reported by B. B. Jones, in charge inspection service, State Department of Markets, is not only of value in this connection but also shows some financial benefits of Idaho standardization and reputation of the Idaho potato as compared with the Wisconsin potato. He says: "In the case of potatoes the inspection is compulsory and every carload of potatoes shipped from the state must be inspected by an official licensed state inspector. This is the first year such a service has been in operation."

"There was considerable opposition to the work to begin with, but as the service improves this opposition wanes and we hope to make it a permanent feature in this state. Our investigations have shown that shipping point inspection has been of considerable benefit to the potato shippers of the state. It has done much to improve the grade of potatoes being shipped out."

"In past years Idaho potatoes have been the standard in this section. We always have looked to Idaho for high grade stock and the dealers have always paid for it. We have always respected the good grade of potatoes that you have put on the market and to our minds it has been attributed to the careful way in which potatoes have been handled and graded."



In the opinion of the writer, shipping point inspection and standardization is yet too new to come to a definite conclusion as to the merits of optional or compulsory inspection, but as experience is gained in this State it appears that the weight of the evidence is drifting in favor of compulsory inspection.

BENEFITS TO POTATO INDUSTRY—
From experience of three years of potato shipping point inspection as conducted in Idaho, the following outstanding points suggest themselves as decided benefits to the potato growing industry of the state derived from the shipping point inspection work:

1. It enables the establishment of grades.
2. Secures a standardized pack and package.
3. It encourages better cultural practices.
4. It encourages the production of a higher grade of potatoes.
5. It encourages the use of better seed.
6. It makes a better class of growers and shippers who are less frequently inclined to evade standards and laws pertaining to honest marketing.
7. It is insurance and protection for the shipper.
8. The inspection is a protection to the growers who put up a good grade of potatoes in a community against neighbors who will not or do not aspire to higher standards.
9. Useful in settling disputes among shippers, transportation companies and buyers.
10. It facilitates marketing.
11. It permits buying at long range on an f. o. b. basis with assurance on the part of the buyer that he is getting the grade which he paid for without seeing the stock and encourages f. o. b. sales.
12. It lessens the chances for rejection at destination on account of a declining market or unscrupulous receiver.
13. It assists materially in the adjustment of railroad claims.
14. It establishes uniformity of marketing practices.
15. It classifies the merits of the stock and permits sales accordingly.
16. It is a powerful educational agency.
17. It places responsibility more accurately for deterioration of stock.
18. When compared with destination inspection, it shows clearly the party responsible for difference in the quality and condition of stock.

Uniform shipping point inspection of potatoes is in its infancy and each state will necessarily be under obligation to the potato growing industry to adjust this service to meet existing conditions.

It is essential that this work proceed on as nearly a uniform basis as possible in order to benefit the majority of growers, buyers, transportation companies and consumers in order to make the above mentioned beneficial points a commercial reality.

The first annual apple show at Spokane, brought out displays of 66 different varieties of apples, all grown in the Spokane Valley.

Westpine Boxes Stand The Test of Storage

Westpine boxes are made from selected air-dried lumber. They take nails without splitting—and they hold them. When placed in storage there is no shrinkage of the wood fibres. Renailing is not necessary.

Ship your apples in Westpine boxes. Your fruit will not be damaged by the weaving action of transportation or breakage that is the result of loosened nails. Your crop will reach the market in perfect condition. Your sales for next year will be made easier.

We will be glad to send you further information on important points to be considered in getting best results from apple boxes.

Box Bureau, Western Pine Manufacturers' Association
510 Yeon Building, Portland, Oregon



Spray Calculations

In figuring the amount of spray materials needed allow 200 gallons of dilute spray mixture for each acre of trees 9 to 12 years old. The average dilution of winter strength lime-sulfur is 12 to 100, hence to find out the gallons of stock solution needed multiply the number of acres by 24 to get an approximate estimate. For the delayed dormant spray multiply by 7. About four pounds of arsenate of lead per acre are needed and one should figure on making four applications a year. Thus, multiplying the acres by 16 will give a good estimate.

There are sure to be losses and regrets if you rely on inadequate spray equipment.

Pomological Society

The American Pomological Society has taken on new life and is seeking widespread support through new memberships. The fee is \$5 a year and, in return, extensive bulletin service, stimulation and co-ordination of fruit growing industry are promised. R. B. Cruickshank, Columbus, Ohio, is secretary-treasurer and memberships should be sent to him.

Heater service on apple shipments over the Union Pacific from Yakima was reduced \$7.48 per car on February 24.

Advertisers in *Better Fruit* are worthy of your business and we trust we are worthy of mention to them when you write.

Pointers on Stock Propagation

By E. J. WATSON

Yakima Washington

CORRECT propagation of nursery stock is of vital importance to, and in reality, the very foundation of the fruit industry, yet how careless many growers are in selecting the stock they buy! One cannot judge the true worth of nursery stock by its appearance, as there are many little details involved in its production which influence the quantity and quality of fruit the trees will produce.

There is a tremendous significance in blood, both in human beings and in animals. It is truly remarkable what has been accomplished in breeding up live-stock to a state of excellence. Just so it is possible to breed up nursery stock to an equally advanced state. It is an indisputable fact that too many nurserymen are not modern or up-to-date in methods relating to the propagation of nursery stock.

The growers are more to blame for existing conditions than the nurserymen, as they do not demand superior stock and many of them would not pay the difference in price between high grade and inferior stock.

In the production of high grade nursery stock there are three essentials to be considered. First come the location and climate in which it is raised. I would much prefer home grown stock, but if this is not

obtainable, I would recommend getting stock from a more rigorous climate than our own.

The second matter of importance is the origin. In propagating nursery stock one must remember that some varieties of trees are susceptible to almost every disease existing while others again are vigorous, hardy and immune from such ailments. As in livestock, so in fruit some crosses will not blend, the offspring being unsightly and tending to degeneracy rather than to invigoration.

The root is the primary factor of the tree for the vigor, longevity, productiveness and quality of fruit depend largely upon it. Many nurserymen have in the past resorted to vinegar plants for seed to develop the root. Some have not yet abandoned this practice. A parallel case is that of the farmer, who selling his marketable potatoes, plants the culls and expects to obtain good results. This happy-go-lucky method of propagating nursery stock, together with lack of knowledge and care of orchards in the growing stage is responsible for so many failures among growers. The saying that "like begets like" is not only an adage or a proverb; it is a stern reality.

THE third essential is that the land should be in a high state of cultivation,

with deep rich soil and good drainage. The size of tree desired and early maturity of the wood can be regulated by cultivation of the land and proper irrigation. Many nurserymen are trying to raise stock on impoverished land, entirely unfit for what was expected of it. Here, in order to get

After A Long Cold Winter

—the hungry gophers are a menace to your trees—Now is the time to get them, before they multiply.

Lee's Peerless Gopher Killer

—is the answer; a small amount on corn-cob, chip or other absorbent material placed in runs will kill them—**TRY IT!**

Write for our FREE CATALOG

—which lists our complete line of Seeds and Plants, Fertilizers, Poultry and Bee Supplies, Sprays and Sprayers.



Friend Sprayers

Five Sizes

High Pressure

Cause less trouble

Cost less to operate

Give real satisfaction

Distributed in the Northwest by

Hood River Spray Co.

Hood River, Oregon

trees of the required size, they use too much water and also use the water too late in the season to allow the trees to ripen thoroughly before fall frosts attack them. There are other reasons that would lead one to condemn nursery stock besides the fact of its being diseased, stunted, inbred, mongrel or because of poor workmanship in grafting and budding.

I say that growers should not seek bargain counter sales in nursery stock. Land is too valuable. Cost of labor not only warrants but demands the best stock that science and skill can produce.

If I were going to set out an orchard, say of Delicious apples, I would select the finest specimens of a vigorous, productive tree, say Arkansas Black, producing highly colored apples. I would select the finest specimens when the apples were fully matured. I would care for the seeds of these and at the proper season I would plant them. When the seedlings were one year old, I would select scions of a tree of equal quality of Delicious and graft into the root stocks of the seedlings. I firmly believe that this method would do away with so many unsightly variations and failures in orchard culture and that the results therefrom would justify the extra cost and labor involved.

In writing our advertisers please mention
BETTER FRUIT.

Plants Quarantined

BY PROCLAMATION of the governor and the Oregon State Board of Horticulture a quarantine on strawberry plants has been made effective and will not be raised until danger of spread of root weevil is entirely allayed. No one may now sell strawberry plants in Oregon without first obtaining written credentials from the Board of Horticulture removing the quarantine on the plants to be sold.

When the quarantine was promulgated some time ago Charles A. Parks, president of the Board of Horticulture, said: "This action on the part of the board was absolutely necessary to protect and preserve the great strawberry industry of the state. The root weevil is a most dangerous pest and unless we take radical steps to prevent its spread within a few years there would be nothing left of this great industry."

Oregon residents who wish to sell strawberry plants need to get in touch with the nearest county fruit inspector or, if none is convenient, should communicate with the state Board of Horticulture.

Thurston County, Washington, is said to be supplying 100 carloads of split cedar grape stakes ordered by California growers. The stakes are cut two inches square and are pointed at one end. They are used to keep the grapevines off the ground.

Codling Moth

This destructive pest requires utmost vigilance. Use ORTHO DRY ARSENATE OF LEAD. Uniform in strength. Mixes perfectly, and stays in suspension a long time.

Write for Ortho Circular

CALIFORNIA SPRAY-CHEMICAL
COMPANY
WATSONVILLE CALIF.

Address Dept. F.



Northwest Orchard Ladders

"The Quality Line"

For Sale by

Leading Dealers Everywhere

Manufactured By

Northwest Fence and
Wire Works
PORTLAND, OREGON



Frost Protection

EVERY progressive orchardist knows that the critical time, when artificial heating of his tracts for a night or two may save him a valuable crop, is just ahead. The time is actually at hand when plans to provide protection against frosts must be complete. It cannot be anything but a sad experience to awaken some morning this spring to find one's crop sadly ruined while that of the neighbor across the fence has been saved by resort to artificial heating.

A good illustration is at hand. It is that of W. C. Stone, proprietor of the Squaw Butte orchard of 13-year-old Italian prunes, at Emmett, Idaho.

"On the morning of April 25, 1921, with the trees in full bloom," reports Mr. Stone, "the temperature dropped to 23 degrees at 2 a. m. Through the use of my orchard heaters, set 40 feet apart each way, I was enabled to save a full crop."

This experience would seem convincing enough to fruit growers of the Northwest that it pays well to be equipped with adequate orchard heating equipment.

Mr. Stone, it should be added, made use of 300 five-gallon cast iron Scheu orchard heaters. Because of the size and efficiency of these he used only 27 to the acre, which is far less than the number of older style heaters considered necessary.

The Department of Agriculture, through the Weather Bureau, has made detailed studies of orchard heating for frost protection and any readers not possessing a copy should send for Bulletin No. 1096.

Growing Apples in Willamette Valley

(Continued from page 11)

satisfactory production per tree.

Growers who are content to raise inferior fruit and put out an inferior pack should be prohibited by law. They can grow C grade apples and worse anywhere in the wide world, and they can grow them quite as cheaply as we can, and it does not cost them \$1 per box for freight and icing, to reach the market.

The eastern grower has his market at his door. We can not compete with the East in growing junk. We should, however, take into account the fact that we have no eastern competition when it comes to marketing extra fancy boxed apples.

Peach blight affects nursery trees as well as older trees. Nursery trees just being set out may well be sprayed with Bordeaux. Spray them where they are heeled in or set them loosely together for the spraying a few hours before planting. This will save spray and time.

▲ ▲ ▲

In writing advertisers kindly mention *Better Fruit*.



23,000,000 People Ready to Buy Your Fruit !

The great markets of New York supply nearly one-quarter of the entire population of the United States with their fruits. Greater New York alone has a population of over 6,000,000, and an average of 432,000 visitors come to New York daily.

Within a radius of 50 miles from New York there are 10,000,000 people, while there are 22,904,873 people within 200 miles of the City. New York not only supplies this great army of people with their fruits, but through these markets the people of the entire United States and Canada must get their supplies of certain fruits. Great quantities of fruits are also exported.

New Yorkers spend an average of \$1,200,000 in restaurants for dinner every night. The people of this great city consume every day an average of 400 cars of fruits and vegetables.

In one week in 1920 there were 1125 carloads of California fruits sold at auction. In addition, the auction sold cargoes of bananas, Spanish onions, Porto Rico citrus fruits, Italian lemons, Cuban fruits and Florida citrus fruits.

Think what a great market this is for your fruit! And think, too, what it would mean in better prices to have an average of 1200 buyers a week bidding for your fruit, as is done when it is sold at auction!

Through our auctions we can quickly dispose of your entire crop at the best market prices. And the cost of selling by this method is less than by other methods, leaving a bigger profit for you. Another thing, you can see that we return to you every cent your fruit brings by comparing the check we send you within 24 hours after sale with the prices printed in the New York Daily Fruit Reporter. No other method gives this publicity.

Our large financial resources and twenty-six years' experience is your guarantee that all shipments sent to us will be handled fairly and expertly.

Investigate our proposition before signing up for your season's output. There is no obligation. Write today.

The Fruit Auction Co.

Established 1896

202-208 Franklin Street, New York City

Twenty to 30 minutes of drying is usually sufficient to make Bordeaux stick to the trees for months, even in the rainiest weather, tests by the Oregon Agricultural College Experiment Station have shown. Only actual rain should stop the orchardist from spraying, says this report, as the mere prospect of rain need not interfere. The station, incidentally, now has available for distribution new and improved instructions for making Bordeaux by adding sugar, to prevent decomposition of the spray.

To set a tree exactly where the stake was, cut a notch in the center of a board about three feet long, set the notch over the stake, set a stake at each end of the board, remove the board, dig the hole, replace the board, and set the tree in its notch.

Here is my dollar for your \$1000 worth knowledge.—Ed. G. Rose, Wenatchee, Wash.

Spraying Roses

IF BLACK spot appeared on the leaves of your rose bushes last year, and the leaves dropped off before the cold weather, now is the time to begin treating them for this year. This disease of the rose bush is known as "black spot" and is caused by a fungus. Besides causing the leaves to drop too soon, it may cause the buds to begin opening again in the fall, with the result that the bloom for the following year is much lessened.

Black spot grows on the leaves in the summer and then stays over in the fallen leaves on the ground during the winter, ready to attack again in the spring. It may be controlled by burning all the fallen leaves late in the fall or early in the spring, and then spraying the bushes just as the leaf buds open.

There are three sprays which may be used, as follows: Commercial lime-sulfur one part to fifty parts of water, or Bordeaux mixture, in the proportions of 5-5-50; or 15 gallons of water, 2 ounces of copper carbonate and one pint of strong ammonia water.

Another method is to dust the bush with a mixture of 90 parts of finely ground sulfur and 10 parts powdered arsenate of lead.

Spraying must begin as the leaf buds are opening and continue at intervals of ten to twelve days, depending on how much rain has fallen.

Lewis Goes East

Professor C. I. Lewis, formerly in charge of the horticultural department of Oregon Agricultural College and for more than two years assistant manager of the Oregon Growers' Co-Operative Association, has taken the position of managing editor of the *American Fruit Grower*, with headquarters in Chicago. In his various capacities with the college and association and through aggressive activities in all organizations related to the fruit industry of the Northwest he has left a record for constructive work. The post to which he goes has become his largely because of this record.

MEANS TO SUCCESS

Salem, Oregon

March 9, 1922

BETTER FRUIT Publishing Co.,
Portland, Oregon.

GENTLEMEN: The enclosed subscription is for one of our clients (an ex-service man) who bought a fruit farm through our agency. We are contemplating giving a one-year subscription to BETTER FRUIT to every ex-service man who buys a fruit farm through us, as a means to help them to make a success of their undertaking. We believe we can help them in no better way.

RADCLIFF & WARING
Real Estate

Figure Your Profit In Apples

Between big, perfect, sound apples—and knotted, dwarfed, unmarketable fruit the kind caused by aphid injury.

By the use of 8 cents to 12 cents worth of Black Leaf 40 Nicotine Sulphate per tree, you can control Aphid, Thrips, Leaf Hopper and other soft-bodied sucking insects.

Just picture the difference in your own orchard between a yield of sound fruit and a crop of knotted and dwarfed "aphid apples."

Why, a mere handful of these
culls will cost you more than
the quantity of Black Leaf 40
required per tree.

BLACK LEAF 40

Nicotine Sulphate

Black Leaf 40 has for many years been the "true and tried" protector of the crops of the progressive growers of the United States and Canada against these insect pests that are so destructive to your orchard profits.

Send for copies of complete spray chart leaflet and bulletins, with name of nearest Black Leaf 40 dealer.

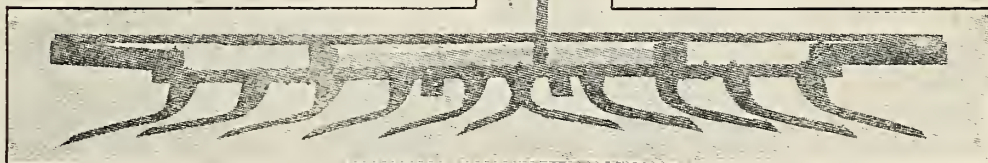
Tobacco By-Products & Chemical Corporation

Incorporated
LOUISVILLE, KENTUCKY

THE KIMBALL CULTIVATOR

DEATH to fern and other
noxious WEEDS.

LIFE to your fruit
TREES.



MOISTURE is absolutely necessary to wood growth and fruit production. Without adequate moisture in your soil, fertilizers will not become soluble, hence will not operate when you need them. Too much irrigation is admittedly dangerous.

Your KIMBALL will hold the natural moisture in your soil by forming a perfect mulch, eradicating weeds at the same time. After your spring plowing and discing the KIMBALL is the only tool you need through the balance of the season.

W. A. JOHNSTON, Mfg.

The Dalles

Oregon

Cherry Fruit-Sawfly
And Its Control

(Continued from page 7)

and results tabulated on the accompanying table.
Referring to the table, it will be noted that the best control was secured with a

successfully controlled by the application of a contact spray (nicotine sulfate), given at the time the blossoms are opening. Arsenate of lead has not proven a satisfactory remedy against this insect. Dusting with Nicodust is thought to be a worthwhile treatment. Destruction of wild plums and willows in the vicinity of infested orchards is also recommended.

Table Showing Results of Sprays for Control of Cherry Fruit Sawfly

Block	Date Application	Material and Type of Spray	Dilution	Per Cent Infestation	Per Cent Control
1	March 6	Arsenate Lead (Rex) as Blossoms opened	2 lbs. to 100 gals.	66 2/3	33 1/3
2		Unsprayed		100	0
3	March 10	Arsenate Lead as Blossoms Opened	2 lbs. to 100 gals.	17	83
	March 25	Arsenate Lead as Petals were falling	Same		
4		Unsprayed		100	0
5	March 25	Arsenate Lead as Petals were falling	2 lbs. to 100 gals.	33	67
6	March 10	Miscible Oil (Rex 35) plus Black Leaf 40, as Blossoms Opened	2 gals. plus 1/2 pint 100 gals.	4	96
7	March 7	Rex Lime Sulfur, plus Black Leaf 40 as Blossoms opened	1 in 12, plus 1/2 pint 100 gals.	3.5	96.5
8	March 25	Arsenate Lead as Petals were falling	2 lbs. to 100 gals.	85	15
	April 5	Same as Above	Same		
9	March 25	Same as Above	Same	56	44

contact spray, i. e., Nicotine sulfate (Black Leaf 40) in combination with either lime-sulfur or a miscible oil, (Blocks VI and VII). Noting the date of application of this spray (March 7-10), it will be remembered that the sluggish adult sawflies are on the trees at this time. Being naturally slow moving, they are easily killed by the powerful contact spray.

The contact insecticide, applied at the time the petals were opening, gave much better control than did the stomach poison treatment, (arsenate of lead) which Mr. O'Gara recommended. Lead arsenate applied as the blossoms are opening, when the petals were falling, and again a week later, produced inferior control to the contact sprays. In other words, at no time did even three sprayings with the stomach poison give as good results as did the one treatment with the contact spray applied as the blossoms were opening.

The writer believes that dusting with Nicodust, (5 per cent) would satisfactorily control this pest, thus making the remedy cheaper and quicker to apply. This point will be tested this season.

Another factor in the economic control of the cherry fruit sawfly was mentioned to the writer by Professor W. T. Clarke, namely the destruction of alternate host plants such as wild plums and willows in the neighborhood of orchards. It has been a common observation that this pest occurs on trees adjacent to creek beds where there is considerable wild growth of such plants.

CONCLUSIONS—The results of this work show that the cherry fruit sawfly can be

Some may question the advisability of a system of pruning which weakens the tree. As a rule it would not be necessary to prune the weaker trees as they usually are heavy bearers. Generally it is only trees with too much vigor that are tardy or shy bearers. Many varieties, especially in western Oregon and Washington, grow entirely too rampant and brushy, making them unfruitful and hard to manage. It is much better to have smaller trees filled with fruit than large ones filled with brush.

MYERS

HONOR-BILT

SPRAY PUMPS

(11)



FOR quick, thorough spraying Myers Spray Pumps are unequalled. Hand Pumps, with easy operating cog-gear handle—Power Pumps with automatic pressure control—give powerful, penetrating spray that reaches every leaf and blossom. The Myers line includes Pumps for Every Purpose, Hay Tools and Door Hangers. Ask your dealer or write us.



TAKE OFF YOUR HAT TO THE MYERS

PUMPS FOR EVERY PURPOSE
HAY TOOLS & DOOR HANGERS

The F. E. Myers & Brother Co.
Church St.
Ashland, Ohio

Free Booklets on Request

Pacific Northwest Distributors



Spokane, Washington Portland, Oregon
Buy From the Local Mitchell Dealer

Lime Exploited

THE STATE Department of Agriculture of California recently gave warning to the effect that it has frequently come upon false and misleading advertisements of companies who are exploiting the sale of agricultural lime under the guise of fertilizer. There are two ways in which deception occurs: First, the word "fertilizer" is used as a part of the company name, and second, the substance advertised is described as a material containing phosphoric acid and potash, two commonly recognized plant foods.

The California chemistry experts have many analyses of these so-called fertilizers and in no case has any appreciable amount of either phosphoric acid or potash been found. In one instance the company's published analysis of its product shows the following: alkalies, none: sulfuric anhydride, none: and phosphoric anhydride, five hundredths. This analysis is printed on one side of the sack, while on the other side there is printed in prominent letters, the words: "phosphoric acid," "sulfur," and "potassium," although the commercial value of five hundredths of one per cent of phosphoric acid would not be more than five or six cents, and the analysis would indicate not even a trace of either potash or sulfur.

"The Department," says the report, protests against the exploitation of lime and marl under such false pretenses, and hopes that at the next session of the legislature some action will be taken to strengthen the present fertilizer law in this respect.

"On the other hand, the Department does not wish to discourage the sale of any substance which is of real benefit to the agricultural industry, but it feels that lime should be sold as lime, and gypsum as gypsum and each sold upon its own merits and not advertised or labelled so as to give the buyer the impression that he is obtaining not only lime or gypsum, but in addition an appreciable quantity of three commonly recognized plant foods, nitrogen, phosphoric acid, and potash, which determine the commercial value of fertilizer."

GROWERS in New York state have this year made experiments in packing apples to compete with the boxed apples of the Northwest. One of the first test shipments consisted of three carloads of the best Baldwins, packed in the Genesee River valley in waterproof fibre boxes holding 40 pounds. These boxes sold on arrival in New York City at \$2.25 a box. Two carloads were put into storage to test the practicability of fibre boxes under storage conditions.

Reports from the West Okanogan Valley, in Washington, indicate that 1000 acres of new orchard will be planted there this spring. Most of the plantings will be to commercial apples.

You do a double favor by mentioning BETTER FRUIT when answering advertisements you find here.

Pests of Strawberry Industry

(Continued from page 6)

SPITTLE BEETLE—Spittle beetles are not beetles at all, but a form of leaf hopper. They were very prevalent in this district last year. The young hoppers appear in the spring and cover themselves with a mass of froth, this is secreted by the insect and is pumped full of air bubbles by placing the tip of the abdomen above the mass and drawing the air down. This material serves as a protection for the insect while it molts its skins for about four or five molts. The last time it is full grown and has developed wings. It then leaves the spittle and flies and hops about.

The adult insect is less than a half-inch long, narrow, with bright green wings folded along the sides. These insects although conspicuous are not serious unless they should be present in enormous numbers. There is no remedy except to hand pick them and destroy them while the insects are young.

SLUGS—Strawberries are sometimes bothered with slugs or snails getting on the berries and eating them. Slugs live and breed generally in weeds and trash next to cultivated fields and travel out from such places in search of food. The cleaning up of such places will help much in the control of them. When abundant in the field and eating the fruit, there is one remedy that is very satisfactory. Take one part, by weight, of calcium arsenate (this is much more powerful than lead arsenate) and sixteen parts, by weight, of chopped green stuff, such as clover, kale, lettuce, wild mustard, or whatever can be secured. Mix up the green stuff and work the one part of calcium arsenate into it. Then sprinkle this green stuff about the patch after sunset. The slugs will eat this material in preference to the fruit and will die from eating it. This method was developed by the Oregon experiment station after several years of testing many different things.

FLEA BEETLES—Flea beetles are the small black jumping beetles that eat holes in the leaves. The beetles emerge from hibernation in early spring and feed voraciously on the tender foliage of the strawberry. The injury to strawberry plants is sometimes very severe. The beetles appear in immense numbers and completely riddle the leaves. They may be kept off, when abundant, by spraying the leaves with Bordeaux mixture 5-5-50, plus lead arsenate, one pound of the powder form to fifty gallons of the spray. This should be put on before blooming and after harvest.

LARGE WHITE GRUBS—Often large white grubs an inch long or so are quite injurious in strawberry fields, eating the plants entirely off. White grubs are most abundant in land which has been for some time in sod, or has been occupied for some

time by old strawberry beds. Much of the loss occasioned by white grubs can be avoided by adopting the one-crop system in strawberry culture and alternating with some crop more or less immune, such as beans or peas.

NEMATODES—Nematodes are very small eelworms. They live in the ground and get into many different kinds of plants. One of the ways they affect plants is to produce upon their roots, galls or swellings. In the case of the strawberry they produce distinct and noticeable symptoms in the form of swellings or galls in any portions of the stems, leaf petioles or runners and characteristic distortions of the leaflets, which become crinkled, misshapen and dwarfed in size.

The nematodes are found within the

swellings. There are several generations in a season.

There is no remedy known except to take up the affected plants or burn them. Every grower is warned to be on the lookout for this pest and report on it to prevent its spread.

Oregon is advocating planting non-susceptible plants for two or three years, so as to starve out the pest. Practice clean cultivation to prevent volunteer plants or weeds from harboring the pest. Cabbage, sunflower, lettuce, celery, corn, tomatoes and asparagus may be used as crops for rotations. The Department of Agriculture and the Idaho Agricultural Experiment Station are now carrying on experiments to control this pest and very likely improved and additional control measures will result.

For your Dormant Spray

DORMOIL

Especially for Leaf Roller, Scale, Aphis, Blister Mite, Red Spider, etc.

DORMOIL has been used with remarkable success in Oregon, Washington and Montana. Write for details

HOOD RIVER SPRAY CO.

Hood River, Oregon

POTASH PROTECTS from frost

AFTER the recent freeze, it was noted that where a fertilizer high in Potash had been used, the damage to the fruit was much less severe.

Fruit buds on trees fed with a well balanced fertilizer containing 10 per cent of Potash also resist frost better.

These facts taken in connection with the improvement in flavor, yield, shipping and keeping quality of fruits and vegetables are further proof that

POTASH PAYS

SOIL & CROP SERVICE, POTASH SYNDICATE

H. A. HUSTON, Manager

42 Broadway

New York

Technique and Tools in Pruning

PRUNING at different times through the growing season has different effects. In early summer when the vitality of the tree is not taxed by the maturing of fruit, the weakening effects are perceptibly less or more easily overcome. If done quite late when the leaves have become somewhat inactive the effects are nearly the same as winter pruning except that slightly more food material is removed.

Authorities disagree as to proper time to summer prune. Some hold that it must be done just previous to the differentiation of the leaf and blossom buds. Just when this occurs we do not know. According to recent observations of the Virginia station, it would probably be about the middle of June. Others advocate pruning at a specific time; just at the close of the vigorous summer's growth while the tree is beginning to store up reserve food, and develop buds for the coming season's growth. The date depends upon the location, variety, methods of culture and season, varying from July until September.

Pruning at any time during the active growing season will have the desired weakening effect. The former possibly may give more immediate results by inducing the formation of fruit buds for the following year. The later pruning when the plant is more or less exhausted from the production of fruit and usually poorer moisture conditions will have a greater weakening effect.

On extremely vigorous growers, or when much thinning out and removing of large branches is required, two summer prunings would be advisable. Tip back just previous to the formation of fruit buds, and thin out and remove large branches just at the close of the vigorous growing season. It takes nerve and decision to remove large branches in the summer when the fruit is on, but the effect on the tree is more satisfactory. The weakening effect more or less counteracts the stimulating effect and is less conducive to water sprouts and an unbalanced condition of the tree.

Pruning Tools—Good tools encourage good work. It is not necessary to have a large variety. Too many tools are cumbersome.

During the first two years of the tree's development the pruning is best done with a pair of small pruning shears. However, the orchardist should always possess a good sharp pocket knife.

Short-handled pruning shears will suffice for the third and fourth years. It is the handiest, strongest and easiest cutting tool for pruning under nine feet in height. It readily cuts branches one and one half inches in diameter.

From the fifth year on practically all the pruning is done with short handled pruning shears and long handled pruners, six to twelve feet in length, according to the height of the tree. With the long

handled pruners all topping back and thinning the top can be done from the ground. This gives the pruner a chance to compare one side of the tree with the other and hence he can make a more shapely tree. It is also a more rapid way than moving a ladder about the tree and using short-handled pruning shears.

The ladder and saw are seldom needed in an orchard receiving annual prunings, but are most useful tools in the renovating of old orchards.

Gathering Up Prunings—Where the prunings are not too large a common hay rake may be used in bunching them.

A low sled with a top ten-foot square is very satisfactory in removing the brush from the orchard. It is easy to load and unload and is convenient under and among the trees.

To set fire to a pile of green prunings and make it burn is quite a difficult matter. Start a good fire with old rails or cord wood, then pile the prunings gradually as they are taken from the orchard.

New Packing Stand

A STAND for packing fruit has been invented by Charles A. Brand, of Roseburg, Oregon. The device includes a tilting rack on which the boxes in which the fruit is packed is supported in a slanting position inclined toward the operator. In this position the packer can more conveniently fill the boxes with fruit.

The device enables the packer to eliminate lifting as with a simple touch of the hand the filled box can be tilted back to a horizontal position and slid off the horizontal rolls to the discharge rack and instantly start the packing of the next box. It makes it possible for women, who do most of the fruit packing, to attend to the entire work without calling for a man attendant to lift the boxes out of the way.

Claim is made for the state of Wisconsin that practically one-half the entire pack of peas in the nation is put up by Badger state canners. According to the Wisconsin College of Agriculture, a total of 4,063,000 cases of peas were canned in the state this season. The total pack of the United States is given as 8,207,000 cases.

According to Washington state officials fruit growers of the state last season spent \$1,500,000 for spray materials and double that sum for applications of the sprays.

Prune growers of Oregon are estimated to have spent \$250,000 last season for Italian and Petite trees.

It is best to treat seed potatoes with corrosive sublimate while they are still dormant.

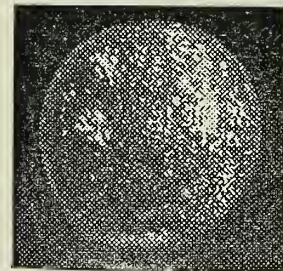


ALBATROSS BRANDS

Prevent

the "blotch" or "burn" of the
spray on fruit

Observe this study in contrasts. The apple at the left was sprayed with Arsenate of Lead—a wonderfully good spray. But the user neglected to mix "Spray Spread" with it. Below is a similar apple—sprayed with the same kind of spray—but Albatross Spray Spread was mixed with the spray. Note the difference—the "lead" dried on the FIRST apple in



Note the "blotch" or "burn" of the lead on this apple

spots or blotches. The second apple received an equal amount of protective spray—but it spread over the apple in a thin film. Appearance and marketing appeal of the apple is thus retained. The pictures tell why Government experts are so enthused over "Spray Spread"—why experienced horticulturists say it has NO equal for spreading an "arsenate of lead" spray.

ALBATROSS "SPRAY SPREAD"

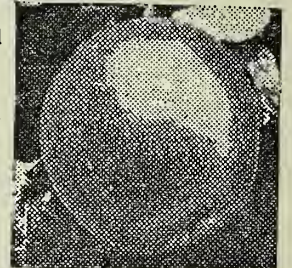
(Calcium Caseinate Compound)

The Original and Genuine Spray Spreader

Quality Features:

1. Very finely ground—always uniform.
2. Quickly Soluble.
3. No lost time.
4. Protects fruit with uniform coating.
5. Does not injure foliage.
6. Recommended by experts.
7. Guaranteed by manufacturers.

Directions sent with each order



Note the uniform, adhering film on this apple

PACKAGES AND PRICES

200 lb. Bbl.	Boxes	1 lb. Pkgs.
20c lb.	22c lb.	25c lb.

Freight prepaid to Northwest points.

NOTE: If you use Casein, specify ALBATROSS Superfine. Also call for Albatross Dry Bordeaux.

General Basic Products Co., Sole Manufacturers, 4796 E. Marginal Way, Seattle, U. S. A. Dealers: Address us for attractive sales proposition.

Long Growing Season

GOVERNMENT weather bureau records show that valley sections west of the mountains, in Oregon and Washington, have growing seasons running from 208 to 261 days. For the easterner who marvels at the wide variety of crops so successfully grown in these sections, this fact is one of the simple explanations. The statistics, it should be noted, are the average for 20 years, and not just for a few favorable seasons.

Here is a vitally important consideration for the man who is comparing advantages of our fruit sections with those of other states and regions. The growing season, it is to be understood, is measured from killing frost to killing frost.

1921 Apple Costs

INFORMATIVE figures on the 1921 apple crop have been compiled by the Wenatchee Valley Traffic Association, showing an average yield for that district of 348 boxes per acre and an average production cost per box of \$1.52. It was said that costs compiled by bankers and others were slightly lower. The association figures can be taken as nearly correct, however, as they were carefully worked out, with every factor included.

Part of the association's report is here quoted:

"Production costs which do not vary appreciably according to the yield per acre amounted to \$336.75 per acre during 1921. Production costs which vary directly according to the yield per acre amounted to .5505c per box. Based upon a crop of 15,000 carloads, the average yield on the 32,250 acres of apples in the Wenatchee North Central District was 348 boxes per acre. Computed on this yield the average cost for the district was \$1.5182 per box.

"The estimated cost per box at different rates of yield for 1921 would be as follows:

Yield per acre	Cost per box
200	\$2.2342
300	1.6740
400	1.3923
500	1.2240
600	1.1117
700	1.0315
8009714
9009247
10008872

"These costs have been very effectively substantiated in the whole by actual cost records turned in by growers for producing the 1921 crop. In nearly every instance costs thus turned in have been a few cents per box higher than the figures herewith presented."

To Kill Currant Worms

Injury by currant and gooseberry maggots, small white worms that tunnel inside the fruit, can be largely prevented by improved cultural practices. The insect spends practically 11 months of the year in the first two inches of surface soil immediately under the bushes or in the area covered by dropping fruit. If this surface soil is stirred frequently in the early spring months many of them are brought to the surface, where they are destroyed by the weather or birds. In commercial plantings, where better cultural practices have been followed, damage by maggots has been reduced to a minimum.

▲ ▲ ▲

In California there is being tried out a new method of fumigation of nursery stock. This is accomplished by vacuum fumigators, which have the approval of the State Department of Agriculture.

of the ground, very good results can be obtained by burying the injured parts in a mound of earth after the bridge grafting has been completed. This treatment partially excludes the air and aids in preventing undue drying out of the injured parts.

The other method of bridging a badly wounded area is by planting one or more young trees around the base of the tree, and grafting the tops into the trunk above the wound; small nails may be driven through the trees into the trunk to hold the parts firmly together.

The wounds incident to joining the tops of small trees to the trunk of the large one should be well covered with wax to prevent drying out.

This method has been employed with success for several years in pear and apple



Will they be dead when you get back?

THEY WILL if you spray with Hall's Nicotine Sulphate. Plant-lice, thrips and similar soft-bodied sucking insects can be wiped out by a systematic spraying with this powerful insecticide.

Authorities agree that Nicotine is the most effective contact poison known.

Hall's Nicotine Sulphate is guaranteed to contain 40% pure nicotine.

Being a vegetable extract it will not injure fruit or foliage.

And—made up as a spray its cost is only two cents a gallon.

Ten-pound tins—\$13.50 Two-pound tins—\$3.50 Half-pound tins—\$1.25.

Buy from your dealer. If he cannot supply you, order direct from us.

HALL'S
NICOTINE
INSECTICIDES

HALL TOBACCO CHEMICAL CO.
3949 Park Ave., St. Louis, Mo.

Hall's Tobacco Dust

For use where dusting is preferable to spraying.

Finely ground and guaranteed to contain a full 1% nicotine.

100-pound sack, \$4.50
2-pound drums .. .25



Crown Gall, Its Causes and Cure

(Continued from page 8)

growing districts of the east and northwest.

To be effective, bridge grafting should be done in spring before growth starts, though sometimes it can be done after growth starts if dormant scions for that purpose can be secured.

PRACTICAL IN MAINE

Agricultural Experiment Station
Orno, Maine, Feb., 25, 1922

BETTER FRUIT,
Portland, Oregon.

GENTLEMEN: Permit me to congratulate you on the February number in particular. It is filled with practical things of interest to the practical orchardist, wherever he may be located.

Yours truly,

W. J. MORSE,
Director

Research on Sprays

ANNOUNCEMENT that will interest most of our readers has just been made by the California Central Creameries Company, to the effect that Ralph H. Smith, for four years in charge of the division of entomology of the Idaho Experiment Station, has been made head of the entomological research laboratories of the Creameries Company, manufacturers and distributors of Kayso, the combined casein spreader and adhesive for orchard sprays.

After graduating from the University of Kansas, Professor Smith served as instructor and also specialized in entomology and plant pathology at Oregon Agricultural College and the University of California. While at the head of the division of entomology at Idaho Experiment Station from May 1918 to March 1922, he carried on extended experiments in commercial orchards at Twin Falls, Idaho, to determine the practical value of spray spreaders in the control of insect pests. He also conducted investigations on the control of various pests including experiments on spraying methods for controlling the codling moth, the twig borer of peach and plum, orchard plant lice and spider mites.

The work on spreaders consisted of trying out different spreader substances under orchard conditions and ascertaining the influence each had in reducing loss caused by pests. He reported and conducted investigations on two new pests, including the red clover eelworm and the leaf-curl plum aphid. The leaf-curl plum aphid is the most important plant louse that affects plum trees in Idaho and other parts of the Northwest. It may be effectively controlled, he found, by adding nicotine-sulfate to the dormant lime-sulfur spray and applying the spray just before the fruit-buds open.

Smith also reported the occurrence of the European Red mite in the western part of the United States in 1919. Previous to this it was not known to exist excepting east of the Allegheny Mountains. He is author of a number of scientific papers and experiment station publications.

THE FIRST carload of broccoli to be sent from the Umpqua Valley, Roseburg, was shipped March 23. The crop is estimated at 125 carloads.

ORCHARDISTS of Hood River Valley will spend \$25,000 for new high-powered spray rigs this spring.

AT A MEETING of the Oregon Co-Operative Growers' Association at Sheridan, Ore., H. E. Allen, H. G. Funk and G. W. Aaron were elected as the local advisory committee.

Marketing News of Interest

REPORTS from New York show that there are but moderate receipts of boxed apples. Shipments from Washington, Oregon and Idaho are decreasing. These states, however, are credited with nine-tenths of the current boxed shipments.

In the week ending March 18, extra fancy Delicious ruled firmer at \$3.25 to \$5.25; fancy brought \$3.80 to \$4.25; the best Rome \$2.75 to \$3.50; extra fancy large Winesaps and Spitzenburgs \$2.50 to \$4.25; fancy, \$2.50 to \$3.50; the most desirable Newtown Pippins, \$2.25 to \$3.35; choice, \$2 to \$2.90; the most attractive British Columbia Jonathans, \$2.25 to \$2.40 and the best McIntosh, \$2.75 to \$3 per box.

THE PRUNE crop of Oregon and Washington is fast being cleaned up, as indicated in reports from the various packing and selling agencies. Earlier predictions that the crop would all be sold by summer were too conservative. Some

weeks ago the Oregon Growers' Co-Operative Association reported that all prunes in its southern Oregon plants had been shipped.

On March 8, M. J. Newhouse, manager of the Washington Growers' Packing Corporation reported that every prune of the 1921 crop in Clarke county, Wash., had been sold. The third dividend, amounting to about \$45,000 was paid, the growers having previously received \$172,000. There is still one payment to be made, but at present the growers have received 11½ cents on 20-30s and 8½ cents on 30-40s.

PRUNES of the California Prune and Apricot Growers' Association are off the market and as a result price advances have been made by the Oregon Growers, ranging from 1 to 4 cents a pound. Demand is not heavy, but retains a fairly healthy tone and dwindling stocks do much toward stiffening quotations.

MORE CARLOADS of boxed apples were shipped out of the state of Washington than from all other boxed apple states combined, according to federal statistics received by the state department of agriculture. Supervisor Charles L. Robinson of the horticultural division has compiled a statement on commercial fruit raised in Washington which shows that there were 32,410 carloads of commercial apples raised last season in this state, representing a minimum value of \$39,259,319. Less than 3,000 carloads probably were shipped within the state for domestic use.

The entire output of commercial fruit was 40,742 cars, valued at \$48,192,038, showing that apples represent about 80 per cent of the fruit industry in Washington.

The various fruits outside of apples and their respective values, as estimated by Supervisor Robinson's report, are: Pears, \$2,525,500; peaches, \$1,583,930; grapes, \$112,000; apricots, \$97,000; cherries, \$567,000.

The prune crop was low last season, due to failures in Clarke county, the crop of fresh prunes being worth about \$680,000 and the dried prunes \$366,000.

The total berry crop is valued at \$2,973,000, divided as follows: Strawberries, \$1,243,000; loganberries, \$198,000; raspberries, \$723,000; blackberries, \$681,000; cranberries, \$68,000, and mixed berries, \$60,000.

The berry acreage last season, including only that land actually producing, was: Strawberries, 6013 acres; raspberries, 3158 acres; loganberries, 1375 acres; blackberries, 1728 acres; currants, 453 acres; gooseberries, 467 acres and cranberries, 600 acres.

A RECENT estimate by Manager H. G. Cockendall, California Prune and Apricot Growers, Inc., placed the unsold portion of the 1921 prune crop of the organization's members at 10,000 tons. The total crop was estimated by the government as 90,000 tons. At the time of the report the association had paid to members \$7,297,000. The total paid for the 1920 crop was \$10,612,125.

DUCKWALL BROS., report having purchased 120 cars of apples from Hood River growers last season and have sold all but one carload. The average net price to the grower is given

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as \$1.664 on the packed apples and as \$1.513 on all apples shipped, this including those jumble packed and unclassified.

THE Sebastopol Apple Growers' Union of California last season sold 434,761 boxes for \$803,434. About 20 per cent more apples were marketed by the growers outside of the union. The season's output was slightly larger than in 1920 and the returns about \$65,000 less.

LESS THAN 10 per cent of the 1921 fruit pack of Salem canneries remains in hands of the packers, according to late estimates. The pack of the year, said to have been the largest in the history of Marion county, is placed at 450,000 cases. Salem boasts that its pack was one-sixth that of the entire Northwest. The pack of the state of Oregon is estimated to have been 1,304,548 cases.

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HOOD RIVER interests report that more than one-half of the 500,000 boxes of apples shipped by water to England this season from Portland and Seattle were supplied by the Apple Growers' Association and Dan Wuille & Co. The association's direct tonnage amounted to 150,000 boxes, while that of Dan Wuille & Co., aggregated 124,000 boxes, assembled from Hood River, White Salmon and Underwood, Wash. In addition to these the Oregon Growers' Co-Operative Association supplied considerable tonnage.

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LOGANBERRY pool No. 1 for dried logans has been closed by the Willamette Valley Prune Association, on the basis of 27.17 cents a pound. This is on the basis of 4¾ to 5 cents a pound for the fresh fruit, according to T. Jenks, manager of the association.

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FOUR CARLOADS of prunes, valued at \$32,000 and produced in one orchard, were recently shipped from Eugene by the Oregon Co-Operative Growers' Association. They were sent by rail to New York, whence they will be shipped to Europe. The prunes were grown and evaporated on the 140-acre orchard of Dr. L. D. Scarborough, at Cresswell, Ore.

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OREGON

AT ROSEBURG last month the Umpqua Date Prune Company was organized to develop date prune orchards. The first experiments are to be made on 320 acres of land acquired in the Upper Umpqua Valley. R. M. Knight, successful prune grower of Day's Creek, has been chosen vice-president and will serve as superintendent. G. Archer Lindsay of Portland is president; M. McDonald, Orenco, is secretary-treasurer and the other directors are R. A. Mitchell, Portland, and George Neuner, Roseburg.

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AT THE ANNUAL meeting of the Mosier Fruit Growers' Association stockholders, R. D. Chatfield was unanimously re-elected manager. He has served in this capacity for 10 years. The directorate for the ensuing year will be this: Dr. C. A. Macrum, president; J. P. Carrol, secretary; J. P. Ross and C. A. Macargar. The Mosier Valley bank continues as treasurer. The organization last season shipped about 300 cars of fruit.

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TOMATO GROWERS of the Milton-Freewater district have organized the Walla Walla Valley Co-Operative Tomato Growers' Association. They count on producing 75,000 boxes of tomatoes this season, and, because of the early season, expect to receive at least \$1 a box. The officers are: L. A. Rineman, president; Charles Waldon, secretary-treasurer; F. E. Mogonier, manager; O. K. Goodman, Thomas Rogers and F. J. McKinney, directors.

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ANNOUNCEMENT at Lebanon that the cannery of the Oregon Canning Company will be operated this year has occasioned gratification on the part of the growers of berries and small fruits in the Santiam River bottom section. There are large acreages of strawberries, raspberries and small fruits and the growers sustained severe loss last year through lack of a market. The cannery is splendidly equipped and employs about 100 persons to operate it near capacity.

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THE LACREOLE Canning Company has been organized at Dallas and expects to be ready to handle the crops of berries and small fruits there this season. The officers are: W. V. Fuller, president; C. B. Sunberg, vice-president; D. H. Cheney, secretary-treasurer.

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S. H. VAN TRUMP, Marion County fruit inspector, has been kept very busy in recent weeks inspecting strawberry plants in both Marion and Polk counties. The inspection is for strawberry root weevil, and must be made before the plants may be shipped by mail, express or freight.

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AFTER THIS summer Dufur will no longer boast of having the largest apple orchard in the world. Plans have been laid and the contract let for the clearing of 1800 acres of the Dufur Orchard Company tract. This land is to be cleared by fall and will be sold to wheat growers. The company is in the hands of a receiver and a court order has authorized the move for removing the trees from what is known as the east half of the big orchard, which had not yet become really productive.

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GROWERS who marketed their blackberries through the Eugene Fruit Growers' Association last year received 5¾ cents a pound for their crops, it was announced at the closing of the pool last month, by J. O. Holt, manager. The association, he said, handled 1,228,264 pounds of blackberries.

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J. M. SEARS, who recently came from Moline, Ill., has purchased George Siefarth's prune orchard at Polk Station, near Dallas. The tract is in the best producing orchard belt in Polk County.

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THE NORTH MARION BERRY GROWERS' Association has disbanded and merged into the Woodburn Fruit Growers' Co-Operative Association which now has 77 members and 415 acres of berries signed up.

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R. T. WILSON has purchased two 10-acre fruit tracts in Garden Valley, near Roseburg, and announces that he will plant them to walnuts.

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HOOD RIVER fruit men are making arrangements to entertain a big group of prominent eastern apple buyers who plan to visit the Northwest in July. The Apple Growers' Association and Commercial Club are at work on the plans. The committee is composed of P. F. Clark, A. E. Woolpert, C. H. Castner, Fielding S. Kelly and John C. Duckwall.

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WASHINGTON

THE North Puyallup Fruit Cannery, it is announced, has been leased to Frank Collinson, of the Star-Collinson Packing Company of Portland, Ore. The annual capacity of the plant is about 100,000 cases and it will be run at capacity this season. Berries and rhubarb constitute most of the pack. H. A. Baker was formerly lessee of the plant.

THE OMAK FRUIT COMPANY has taken over the property of the Omak Fruit Growers, Inc., a co-operative organization which had handled most of the apples grown around Omak. Incorporators of the new company are: Martin Miller, Dr. E. E. Copple, George W. Lee, and F. C. Paine. The property consists of three warehouses capable of handling 400 cars of apples a season, a spur track and 9½ acres of land.

THE OKANOGAN Produce Company has been incorporated by James T. Kilpatrick, Charles Ostenberg and B. Garigen, to take over the warehouse business of the Farmers' Warehouse Association at Okanogan, which recently closed a retail store and warehouse business. Kilpatrick was formerly manager for the farmers.

THE Walla Walla Valley Prune Growers' Co-Operative Association has been organized, with W. R. Parvin as manager and approximately 400 members, who count on shipping between 600 and 800 cars of prunes this season.

J. W. YOUNG, manager of the cannery at Mossyrock, reports that he expects to plant 2½ acres of Cuthbert raspberries and a like acreage of logans this season. Eventually he expects to have 20 acres in cane berries.

THE APPLE crop of the Palouse Corporation at Waverly, Fairfield and Four Lakes, near Spokane, sold for \$101,000 and paid expenses for the season of 1921, according to H. T. Hubbard, the receiver. The Earl Fruit Company foreclosed on the property and has been providing the funds necessary to finance it.

FRUIT GROWERS at Meyers Falls, 75 miles north of Spokane, at a recent meeting decided to form a local organization and take over the warehouse which belonged to the now defunct Spokane Fruit Growers' Association.

FOR THE first time in history the executive committee of the International Apple Growers' Association will meet in the Northwest, word having been sent to A. R. Rule, of the Northwestern Fruit Exchange, that the committee will convene July 26, in Seattle.

THROUGH a friendly suit, plans for re-organization of affairs of the Puyallup & Sumner Fruit Growers' Canning Company have been set in motion. William N. May has been appointed receiver, to direct the reorganization task.

DR. F. D. HEALD of the State College has issued warning to potato growers of the state against a new disease known as skin-spot. He says the disease occurs in storing. It came from Europe and is now present in Canada. It was found on potatoes shipped into Spokane from British Columbia.

A NEW PRICE for land in the Buena district, Yakima Valley, was established recently in the sale of 27 acres of bearing orchard by E. S. Smith, George W. Pearson and W. E. Humphrey, to Jacob and Manuel Matson for \$20,875.

AT THE annual meeting of the Yakima County Horticultural Union, the valley's largest shipper of fruit, steps were taken to increase the capital stock to \$500,000 and to rebuild the Selah

warehouse. During the past season the union received on sales \$2,354,278 and turned over to members \$2,228,311.

GRAYS HARBOR County potato growers are laying careful plans this season to eradicate rhizoctonia disease, which has been the greatest enemy of the industry in seasons past. A series

of control demonstrations, featuring the corrosive sublimate treatment, has been arranged by Professor Zundel of the State College.

EARLY LAST month a petition was filed in superior court at Wenatchee asking that a receiver be appointed for the Manson Fruit Growers' Co-Operative Association.

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One year One Dollar

CALIFORNIA

EARL G. DELZELL has been unanimously elected general manager of the California Fruit Growers' Exchange, to succeed G. Harold Powell, who died suddenly February 18, while attending a dinner party at Pasadena. Mr. Delzell had been assistant general manager for a number of years. He began work with the exchange as an office boy. Mr. Powell was very widely known and respected in the fruit industry.

MEETINGS to be held at Sacramento have been announced as follows by Director G. H. Hecke of the Department of Agriculture: May 29 and 30, Convention California County Horticultural Commissioners; May 31, Federal Horticultural Board; June 1, County Horticultural Commissioners and Nurserymen.

ME. O'DEA, who has been fruit and vegetable inspector in the shipping inspection service, has resigned, effective April 15, to become a representative of the American Fruit Growers', Inc., in Sonoma and Napa counties.

AS A MEANS of giving the public instructive information about its doings, the California Prune and Apricot Growers' Inc., has appointed Dr. F. M. Coleman as lecturer for the organization. Dr. Coleman, who was formerly a grower, will be available for speaking tours, and will probably visit the leading colleges and universities of the Pacific Coast as well as appearing before innumerable societies and conventions in California.

STATE Quarantine Guardian L. O. Haupt, reported that he found a shipment of 10,000 prune trees from the Portland Wholesale Company, Portland, Oregon, infested with peach tree borer. When notified, the shippers said the trees were grown near Woodburn, Ore., and requested that they be destroyed.

FRANK R. BRANN, authority on horticultural matters, has been appointed county horticultural commissioner of Tulare county to succeed Charles F. Collins.

THE FAIROAKS Fruit Company last season shipped about 100 tons of bulk olives to eastern points, sending them in lug boxes of an average weight of 25 pounds. Instructions for the processing of ripe olives in the home have been broadcasted. This plan of shipping bulk olives to the consumers, who will themselves pickle them, is said to be proving quite popular and successful.

A MOVE was made at a recent meeting of the California Cannery League, in San Francisco, to have the University of California establish a fruit canning laboratory.

IN A PEACH growers' contest conducted annually in Sutter county, the highest record last year was 31,200 pounds per acre, considerably under the 1920 record, due to frost and unusual rains.

A 40-BARREL shipment of strawberries was recently sent from San Francisco by boat, destined for England. The berries were frozen in sugar last August and September and are shipped under refrigeration of about 20 degrees.

PAYMENTS to members by the California Walnut Growers' Association for 1921 amounted to \$7,986,262, as compared with \$7,791,093 in 1920. It is believed this year's crop will bring in more than \$11,000,000. The association handled 82 per cent of the state's walnut crop in 1920 and 86 per cent in 1921.

W. A. MOREHEAD, a pear grower with an orchard near Woodbridge, on the Mokelumne river, reports that it has been necessary for him to put up a wire mesh fence to protect his

trees from beavers. The animals cut down several of his best trees.

IT IS REPORTED that more than 100,000 fruit trees, most of them apples, will be planted this season in Mendocino county.

LESLIE M. SHAW, former governor of Iowa and later secretary of the treasury, recently purchased a 20-acre prune orchard near Santa Rosa.

THE California Pear Growers' Association last season paid its members more than \$500,000, as compared with double that amount in 1920. Since 1918 the membership has grown from 218 to 1048.

FROM 6½ acres of Elberta peaches, L. P. Bisantz of Reedley, harvested 112 tons and his dried peaches ran three tons to the acre. A block of 10 acres of Wickson plums averaged 645 pounds to the tree. From these tracts and an additional 1½ acres of Lovell peaches, 18 acres in all, he sold fruit worth \$12,000.

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GHIRARDELLI'S
Ground Chocolate

With the Poultry

BUYING BABY CHICKS

ONE OF THE great developments of the last few years is the hatching of baby chicks in large quantities by specialist hatchers.

The industry has now reached a point where millions of these youngsters are turned out yearly. The leading hatcheries are equipped with big scientific incubators, loaded with eggs from selected breeding farms, and operated so efficiently that husky, vigorous chicks are the result. These chicks are shipped long distances, which makes it possible for buyers to secure the babies of their choice, economically and safely, and avoid all the uncertainties and bother of home hatching, and the necessity of maintaining breeding pens.

As a consequence, many farmers and poultry keepers buy their chicks ready hatched by the hundreds and thousands, giving their time to raising and caring for a greater number of youngsters than would be possible had they to fuss also with sitting hens or individual incubators.

Owing to the care exercised by responsible hatcheries, in securing and keeping up their breeding flocks, the vigor and general quality of the chicks is a revelation to those not familiar with the industry.

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COUNTY INSPECTION PLAN

THE COUNTY extension organization in Alameda county (Hayward District) California, has taken steps through its poultry division to raise the standard of all poultry in the county by improving the quality of fowls used in breeding flocks. Owners of hatcheries in the county have entered into an agreement with the county extension organization to use eggs for incubation from selected breeding stock, excluding the incubation of eggs from the general run of fowls in the locality, with the understanding that the county extension organization shall furnish judges to pass on the desirability of birds selected for breeding. Already 20,000 fowls have been inspected, and those that have met the requirements in weight, laying, size, and shape of eggs, and in other ways, have been accepted as eligible for the production of eggs for hatching.

This method of controlling the quality of the poultry in a county is expected to result in a rapid general improvement in the productivity of the flocks. It should also give the county a good reputation wherever hatching eggs or birds are sold.

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AS THE WEATHER begins to warm up it is urgent that the flock owner pay more attention than ever to disinfecting the poultry house and yards. Paint the roosts with a good lice killer and sprinkle insecticide plentifully in the nests.

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WHERE THERE is only limited range for the flock it is an excellent plan to divide the space, spade or plow up the soil and sow oats or similar spring crop on one portion. When this crop gets a heavy start the flock is turned in and if possible the other portion is then seeded.

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ONE NEW JERSEY farm sells the egg output of 1000 hens to city folks through parcel post shipments. It is possible to work up such a trade and to make it pay the extra costs of containers and postage.

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EXTREME care must be taken not to crowd chicks in the brood coops. Crowding will result in overheating the chicks and this will mean stunted growth and possibly some dead chicks. A good house can be built from a dry-goods box or piano box, which may be covered with tur paper and prepared at small cost.

SICKNESS and disease usually start in unclean quarters. In such places lice and mites get their start and it is far easier to avoid them than to get rid of them, once they have a start. The coops should be cleaned and sprayed once a week, and clean chaff, shavings or sand put on the floor.

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ON CLEAR days now be sure to open the curtains if yours is an open-front house, as the sunlight is one of the finest germ killers at the poultryman's command.

▲ ▲ ▲

WASTE precious little time with ailing or feeble chicks. Even should you succeed in pulling them through, the chances are they never will be virile, paying birds.

▲ ▲ ▲

WET LITTER is a menace to the health of chicks or hens. It makes fine fertilizer on the garden and had better be put there promptly.

▲ ▲ ▲

IF YOU DID not mate up really worthy breeding pens it will pay you to buy high-class eggs or baby chicks.

▲ ▲ ▲

IT IS virtually as dangerous to overheat the chicks in the brooder as it is to have them get chilled.

▲ ▲ ▲

YOU MAY be wiser than the concern that manufactures your incubator but the chances are that you will get best results by following the directions that accompany the machine.

Arrow Carbolineum

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Protects poultry against vermin—Preserves wood against decay. When you buy Carbolineum be sure you get Carbolineum and not something called just as good. Write for prices and circulars.

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We have been getting a great lot of inquiries from our ad in BETTER FRUIT.—Martin Bros., Brownsville, Oregon.

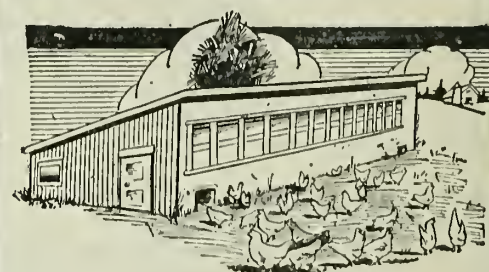
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BETTER FRUIT PUBLISHING COMPANY

TWELFTH AND JEFFERSON STREETS PORTLAND, OREGON

Poison Problem Of Beekeepers

By H. A. SCULLEN

Specialist in Bee Culture, Oregon Agricultural College

THIS IS OFFERED, not because the writer is authority on the problem of spray poison which has apparently destroyed so many bees in the apple districts of Washington the past year and previous years, but rather with the hope that the readers of BETTER FRUIT may, by observation and study, assist in finding some solution for the problem.

That this is a problem which is of vital interest to the fruit producer, as well as the honey producer, need hardly be emphasized. Many of the more important fruit districts of the states of Washington, Oregon and Idaho are fast becoming destitute of bees since the commercial beekeeper is moving away, and the few isolated hives remaining are being killed off. In addition to this, the various native wild bees, which assist to some extent in pollination, are doubtless being affected by the poison.

In an effort to determine the extent of the damage to the beekeepers and to learn, if possible, the source of the danger, a questionnaire was sent to 392 beekeepers in the orchard districts of Washington in 1919. Reports were received from 107 beekeepers, who reported a total of 8490 colonies. Forty-seven beekeepers reported trouble from spray poison. Their estimated financial loss was \$5,510 from colonies completely killed and their estimated loss from the 1919 crop of honey was \$43,667 or a total of approximately \$50,000.

One very interesting fact brought out by the question as to how far from sprayed orchards the poisoned bees were located, was that out of 53 apiaries represented, 43 were one-half mile or less from sprayed orchards. The greatest distance poisoned bees were from sprayed orchards was two miles. It was also of interest to note that several uninjured apiaries were in or near sprayed orchards. A further study of the management practiced in such orchards may assist in finding a solution, in part at least, of the problem.

Replies from the questionnaire, as well as personal observations, have shown that a certain amount of loss has resulted from both the calyx spray and the second lead arsenic spray. Some reports indicate that still later sprays have also been serious with the bees. It is also important to note that poisoning seems to occur both during the nectar secretion and while there is a dearth of nectar. There, therefore, seems to be three possible sources of danger: (1) The bloom of the apple; (2) the bloom of the clover crop and other plants under the trees, such as dandelion, and (3) the moist spray on the foliage both of the trees and underlying vegetation.

There is some evidence that poison is being carried into the hive on the pollen collected either

from the apple bloom or from the bloom of vegetation under the trees.

THE WASHINGTON Experiment Station is now carrying on experimental work with various repellents, and it is hoped that some substance of practical value will be discovered as well as other important means of eliminating the trouble.

The symptoms of spray poison seem to be especially noticeable in the morning when the nurse bees are seen crawling about over the ground in front of the hive in considerable numbers, and in a more or less weakened condition. Some report evidence of swelling and dysentery, also. Many of the field bees doubtless die before reaching home. Since, however, it is a simple matter to send samples to the Bee Culture Office at Washington for analysis, minor symptoms are less important. The brood is also affected either by direct poisoning or by neglect due to the loss of nurse bees or both. Some report the loss of queens also.

In view of our limited observations, only a few general recommendations can be made:

First. Commercial bee yards should be moved to a distance greater than two miles from the orchard before spraying is started. This is expensive and should not be necessary.

Second. Late application of calyx spray, giving special attention to late and irregular blooming varieties of apples.

Third. A system of management for the cover crop, which will not allow heavy foliage or blooming under the trees during spraying.

Fourth. When the poisoning occurs at a dearth of nectar some of the danger might be averted by feeding. Some have reported success by this method.

Fifth. The use of a repellent in the spray, such as has been used in a limited way in Gipsy and Brown-tail moth control in Massachusetts, has been suggested. This method of control presents several problems not the least of which is the introduction of something into the spray which would repel the bees, but not the moth larva.

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I have changed my address and I have surely missed BETTER FRUIT. It is the only paper, and I think all people interested in agriculture or horticulture should not do without it.—Charles H. Scheer, Idaho.

TREES AND SHRUBS



Fruit trees budded from bearing orchards. Apple, Pear, Cherry, Peach, Plum, Prune, Apricot, Quince, Grape Vines, Shrubbery, Plants, Raspberries, Blackberries, Logans, Dewberries, Asparagus, Rhubarb, Flowering Shrubs, Roses, Vines, Hedge, Nut and Shade Trees. Carriage paid. Satisfaction guaranteed.

WASHINGTON NURSERY CO.

Toppenish, Washington.

Salesmen everywhere. More wanted.

GEORGE STRUCK has purchased for \$17,000 the 40-acre bearing orchard of J. R. Nunamaker, in the Upper Valley, at Hood River. The tract is considered one of the best in the Upper Valley and is on the new trunk line of the Mount Hood Loop Highway, near Parkdale.

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A RECENT report tells of establishment of a new prune packing record at the Salem plant of the Oregon Growers' Association. In eight hours running time the plant packed out 3011 boxes of prunes, an average of 375 boxes an hour. In filling a rush order the plant some years ago packed out 3500 boxes in ten hours' time.

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Advertisers appreciate it if you refer to BETTER FRUIT when writing them.

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